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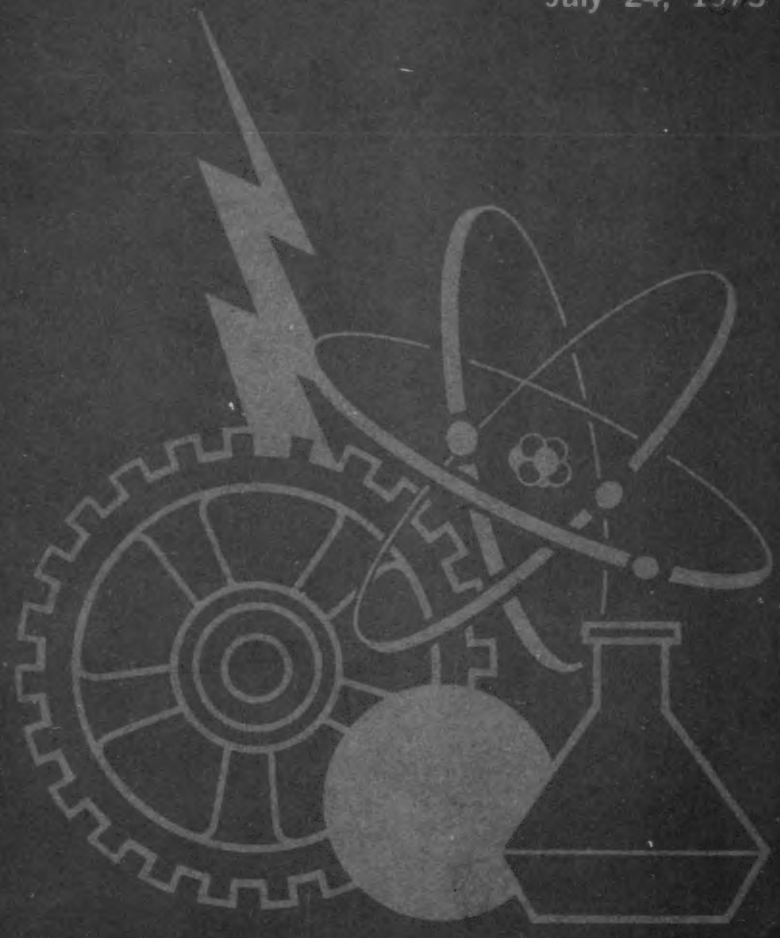

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U. S. DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
TRADEMARK REGISTRATION TREATY

At the conclusion of the Vienna Diplomatic Conference on industrial property, the Trademark Registration Treaty was signed on June 12, 1973 for the United States. This Treaty is designed to simplify the procedures for obtaining international registration of trademarks for United States companies doing business abroad.

The Treaty was unanimously adopted at the final plenary session. In addition to the United States, the United Kingdom, the Federal Republic of Germany, Italy, Portugal, Hungary, San Marino and Monaco also signed. Some forty-six countries were represented at the Conference. In their closing statements most of the other delegations present indicated their hope to sign before the end of the year. The Treaty remains open for signature through December 31, 1973. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession.

The negotiations at Vienna represent the climax of the work of several committees of experts and working groups which have met at Geneva since 1970 with the assistance of the World Intellectual Property Organization (WIPO). The U.S. delegation to the Vienna Conference was composed of officials from the Department of State, the U.S. Patent Office and advisors from the private sector. Previous versions of the proposed Treaty were published on February 22, 1972; September 19, 1972; and February 20, 1973, in the OFFICIAL GAZETTE *of the U.S. Patent Office. Published in this issue is the complete text of the Trademark Registration Treaty and its Regulations, as adopted by the Conference. For convenience, in addition to the text of the Articles and Regulations as adopted there is included a table of contents at the end of each section.*

Additional copies of this material are available upon request to the Commissioner of Patents.

ROBERT GOTTSCHALK,
June 22, 1973 *Commissioner of Patents.*

TRADEMARK REGISTRATION TREATY

Adopted at Vienna, June 12, 1973

INTRODUCTORY PROVISIONS

ARTICLE 1

Establishment of a Union

The States party to this Treaty (hereinafter called "the Contracting States") constitute a Union for the international registration of marks.

ARTICLE 2

Abbreviated Expressions

For the purposes of this Treaty and the Regulations and unless expressly stated otherwise:

(i) "international registration" means a registration effected under this Treaty by the International Bureau in the International Register of Marks;

(ii) "international application" means an application filed for international registration;

(iii) "applicant" means the natural person who or legal entity which files the international application;

(iv) "owner of the international registration" means the natural person or the legal entity in whose name the international registration stands in respect of all or fewer than all the designated States and in respect of all or some only of the goods and/or services listed in that registration;

(v) "mark" means both a trademark and a service mark; it also includes a collective mark within the meaning of Article 7*bis* of the Stockholm (1967) Act of the Paris Convention for the Protection of Industrial Property and a certification mark whether or not such certification mark is a collective mark within the said meaning;

(vi) "national mark" means a mark registered by a government authority of a Contracting State having the power to grant registrations with effect in that State; references to a *national mark* shall not be construed as references also to regional marks;

(vii) "regional mark" means a mark registered by an intergovernmental authority other than the International Bureau having the power to grant registrations with effect in more than one State;

(viii) references to any *final* decision or *final* refusal shall be construed as references to a decision or refusal against which there is no remedy, or against which all remedies have been exhausted, or where the time limit for asking for a remedy against the refusal or decision has expired;

(ix) references to any *publication by the International Bureau* shall be construed as references to publications effected in the official Gazette of that Bureau;

(x) references to the *date of the publication* of the international registration or to the *date of the publication* of the recording of the later designation shall be construed as references to the date of that issue of the official Gazette of the International Bureau in which the international registration or the recording of the later designation, as the case may be, has been published;

(xi) references to any *recording by the International Bureau* shall be construed as references to recordings made in the International Register of Marks;

(xii) "designated State" means any Contracting State in which the applicant or the owner of the international registration desires that such registration produce the effects provided for in this Treaty and which has been identified for that purpose in the international application or any request for the recording of later designations;

(xiii) "national Office" means the government authority of a Contracting State entrusted with the registration of marks; references to a *national Office* shall be construed as referring also to any intergovernmental authority which several States have entrusted with the task of registering regional marks, provided that at least one of those States is a Contracting State, and provided that such authority has been empowered to assume the obligations and exercise the powers which

this Treaty and the Regulations provide for in respect of national Offices;
(xiv) "national register of marks" means the register of marks kept by a national Office in which national and/or regional marks are registered;
(xv) "designated Office" means the national Office of the designated State;
(xvi) references to *national law* shall be construed as references to the national law of a Contracting State and, where a regional mark is involved, to the regional treaty providing for the registration of regional marks;
(xvii) "Madrid Agreement" means the Madrid Agreement Concerning the International Registration of Marks;
(xviii) "Union" means the Union referred to in Article 1;
(xix) "Assembly" means the Assembly of the Union;
(xx) "Organization" means the World Intellectual Property Organization;
(xxi) "International Bureau" means the International Bureau of the Organization and, as long as it subsists, the United International Bureaux for the Protection of Intellectual Property (BIRPI); and where any provision refers to the receiving of documents, or of payments, by the International Bureau, it also includes any agency of that Bureau established under Article 32(2)(a)(ix);
(xxii) "Director General" means the Director General of the Organization;
(xxiii) "International Classification" means the classification established under the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks;
(xxiv) "Regulations" means the Regulations referred to in Article 35.

CHAPTER I: SUBSTANTIVE PROVISIONS

ARTICLE 3

International Register of Marks

(1) [*International Registrations*] The International Bureau shall register marks in the International Register of Marks according to the provisions of this Treaty and the Regulations.

(2) [*International Applications*] International registrations shall be effected in the basis of international applications.

ARTICLE 4

Right To File International Applications and To Own International Registrations

(1) [*Entitlement*] (a) Any resident or national of a Contracting State may file international applications and may own international registrations.

(b) If there are several applicants, they shall have the right to file an international application only if all of them are residents of nationals of Contracting States.

(c) If there are several owners of an international registration, they shall have the right to own such a registration only if all of them are residents or nationals of Contracting States.

(2) [*Natural Persons*] (a) Any natural person shall be regarded as a resident of a Contracting State if:

(i) according to the national law of that State, he is a resident of that State, or
(ii) he has a real and effective industrial or commercial establishment in that State.

(b) Any natural person shall be regarded as a national of a Contracting State if, according to the national law of that State, he has the nationality of that State.

(3) [*Legal Entities*] (a) Any legal entity shall be regarded as a resident of a Contracting State if it has a real and effective industrial or commercial establishment in that State.

(b) Any legal entity shall be regarded as a national of a Contracting State if it is constituted according to the national law of that State.

(4) [*Different Residence and Nationality*] If the State of the residence and the State of the nationality of the applicant or owner of the international registration are different, and only one of those States is a Contracting State, the Contracting State alone shall be considered for the purposes of this Treaty and the Regulations.

(5) [*Certain Associations*] Where under the national law of any Contracting State an association of natural persons or legal entities may own marks notwithstanding the fact that it is not a legal entity, it shall be entitled to file international applications and to own international registrations, provided it is a resident or national of that State within the meaning of paragraph (3).

(6) [*Domestic Filing*] (a) The national law of any Contracting State may provide that, where the applicant is both a resident and a national of that State, an international application may be filed only if the mark that is the subject of the international application is, at the time of the filing of that application, the subject of an application for registration, in the name of the said applicant, in the national register of marks of that State in respect of at least those goods and/or services listed in the international application.

(b) Subparagraph (a) shall not apply where, at the time of the filing of the international application, the mark that is the subject of the international application is already registered in the name of the applicant in the national register of marks of the said State in respect of the said goods and/or services.

ARTICLE 5

The International Application

(1)(a) [*Mandatory Contents*] The international application shall contain, as specified in this Treaty and the Regulations:

(i) an indication that it is filed under this Treaty,
(ii) indications concerning the applicant's identity, residence, nationality, and address,
(iii) a reproduction of the mark,
(iv) a list of goods and/or services in which the terms are grouped under the applicable classes of the International Classification and in which each term is comprehensible, permits classification in one class only of that Classification, and, as far as possible, is one that appears in the alphabetical list of goods and/or services of the said Classification,
(v) the identification of the designated State or States,
(vi) in respect of any designated State in which the effects provided for in this Treaty are available either as if the mark had been applied for and registered as a national mark or as if the mark had been applied for and registered as a regional mark, an indication of the choice between the two,
(vii) in respect of any designated State in which the effects provided for in this Treaty are desired as for a collective mark or a certification mark, an indication to that effect.

(b) [*Optional Contents*] The international application may contain a declaration, as provided in the Regulations, claiming the priority of one or more earlier applications filed in or for any country party to the Paris Convention for the Protection of Industrial Property. Furthermore,

the international application may contain such additional indications as are provided for in other provisions of this Treaty and in the Regulations.

(c) [*Language, Form, Signature, Fees*] The international application shall be in a prescribed language and in the prescribed form, shall be signed as provided in the Regulations, and shall be subject to the payment of the prescribed fees.

(2) [*Filing With International Bureau*] International applications shall be filed direct with the International Bureau.

(3) [*Filing Through National Office*] (a) Notwithstanding paragraph (2) but subject to subparagraph (c), the national law of any Contracting State may provide that international applications of residents of that State may be filed through the intermediary of the national Office of the said State.

(b) Where the international application is filed through the intermediary of a national Office competent under subparagraph (a), that Office shall indicate on the international application the date on which it received that application and shall promptly transmit the same to the International Bureau, as provided in the Regulations.

(c) Any Contracting State on whose territory an agency of the International Bureau, established under Article 32 (2)(a)(ix), is functioning shall, at least for the time such agency functions, suspend the application of any provision of its national law referred to in subparagraph (a) and Article 6(3)(a).

ARTICLE 6

Later Designation

(1) [*Possibility of Later Designation*] Any Contracting State not designated in the international application or whose designation has ceased to have the effects provided for in Article 11 may be designated by the applicant or, once the international registration has been effected, by the owner of the international registration, as provided in the Regulations ("later designation").

(2)(a) [*Mandatory Contents; Filing With International Bureau*] Any later designation shall be the subject of a request for the recording of later designations. Several States may be designated in the same request. The request shall be filed direct with the International Bureau and shall contain, as specified in the Regulations:

(i) an indication that it is for the recording of later designations under this Treaty,

(ii) indications concerning the identity, residence, nationality and address of the applicant or, where the international registration has already been effected, of the owner of the international registration,

(iii) the identification of the international application or, where the international registration has already been effected, of such registration,

(iv) the identification of the later designated State or States,

(v) in respect of any later designated State in which the effects provided for in this Treaty are available either as if the mark had been applied for and registered as a national mark or as if the mark had been applied for and registered as a regional mark, an indication of the choice between the two,

(vi) in respect of any later designated State in which the effects provided for in this Treaty are desired as for a collective mark or a certification mark, an indication to that effect.

(b) [*Optional Contents*] The request may contain a declaration, as provided in the Regulations, claiming the priority of one or more earlier applications filed in or for any country party to the Paris Convention for the Protection of Industrial Property. Furthermore, the request may contain in respect of any State designated therein a list of goods and/or services, provided that, if that list is different from the list of goods and/or services included in the international registration as published or, if the international registration has not yet been published, from the list of goods and/or services included in the international application after any limitation under Article 7(4), it shall conform with the formal concept of limitation as defined in the Regulations. Finally, the request may contain such additional indications as are provided for in other provisions of this Treaty and in the Regulations.

(c) [*Language, Form, Signature, Fees*] The request shall be in a prescribed language and in the prescribed form, shall be signed as provided in the Regulations, and shall be subject to the payment of the prescribed fees.

(3) [*Filing Through National Office*] (a) Nothwithstanding paragraph (2)(a) but subject to Article 5(3)(c), the national law of any Contracting State may provide that requests for the recording of later designations by residents of that State may be filed through the intermediary of the national Office of the said State.

(b) Where the request for the recording of later designations is filed through the intermediary of a national Office competent under subparagraph (a), that Office shall indicate on the request the date on which it received that request and shall promptly transmit the same to the International Bureau, as provided in the Regulations.

ARTICLE 7

International Registration or Declining of the International Application

(1) [*No Defects*] Subject to paragraphs (2) to (5), the International Bureau shall promptly effect the international registration as applied for, and the date under which such registration shall be effected ("international registration date") shall be the date on which the international application was received by the International Bureau or, in the case of an international application filed through the intermediary of a national Office under Article 5(3), the date on which it was received by that Office provided that the said application is received by the International Bureau before the expiration of 45 days from that date. The International Bureau shall issue to the owner of the international registration a certificate of international registration.

(2) [*Defects Which Necessarily Entail a Later Registration Date*] (a) Where the International Bureau finds any of the following defects, that is to say, where:

(i) the international application does not contain an indication that it is filed under this Treaty,

(ii) the international application is in a language other than one of the prescribed languages,

(iii) the international application contains no indications concerning the residence or nationality of the applicant or only such indications as do not permit the conclusion that he has the right to file international applications,

(iv) the international application contains no indications concerning the applicant's identity and address or only such indications as do not permit him to be identified and reached by mail,

(v) the international application does not include the reproduction of the mark,

(vi) the international application does not contain a list of goods and/or services,

(vii) the international application does not designate any Contracting State,

(viii) no fees have been received by the International Bureau on or before the date on which the international application is received by the Bureau or, where the international application is filed through the intermediary of a national Office under Article 5(3), no fees have been received by the International Bureau within 45 days from the date on which that Office received the international application,

(ix) the amount of the fees received by the International Bureau by the date referred to in item (viii) does not attain the amount ("minimum amount") fixed in the Regulations,

it shall invite the applicant to correct the defect; however, where the defect referred to in item (iv) makes it unlikely for the invitation to reach the applicant, the International Bureau is not required to send such invitation.

(b) If the defect is not corrected within three months from the date on which the International Bureau received the international application, the International Bureau shall decline that application.

(c) If the defect is corrected within the time limit referred to in subparagraph (b) and unless the international application is declined under paragraph (3)(b), the International Bureau shall effect the international registration, and the international registration date shall be the date on which that Bureau received the required correction or the prescribed amount of the fees, unless a later date is applicable under paragraph (3)(d).

(3) [*Defects Which Do Not Necessarily Entail a Later Registration Date*] (a) Where the International Bureau finds any of the following defects, that is to say, where:

(i) the amount of the fees received by the International Bureau by the date referred to in paragraph (2)(a)(viii) is less than the amount prescribed but attains the minimum amount,

(ii) the international application does not contain, in respect of any designated State to which Article 5(1)(a)(vi) applies, the indication of the choice referred to in the said provision,

(iii) the international application is not signed,

it shall invite the applicant to correct the defect.

(b) If the defect is not corrected within three months from the date on which the International Bureau received the international application, the International Bureau shall decline that application or, if the only defect which is not corrected within the said time limit is the defect referred to in subparagraph (a)(ii), the International Bureau shall decline to record the State concerned as a designated State.

(c) If the defect is corrected before the expiration of one month from the date of the invitation referred to in subparagraph (a) and unless the international application is declined under subparagraph (b) or paragraph (2)(b), the International Bureau shall effect the international registration, and the international registration date shall be the date referred to in paragraph (1), unless a later date is applicable under paragraph (2)(c).

(d) If the defect is corrected later than at the expiration of one month from the date of the invitation referred to in subparagraph (a) but earlier than at the expiration of three months from the date on which the International Bureau received the international application, and unless the international application is declined under paragraph (2)(b), the International Bureau shall effect the international registration, and the international registration date shall be the date on which that Bureau received the required correction or payment, unless a later date is applicable under paragraph (2)(c).

(4) [*Classification Causing Increase in Fees*] (a) Where the International Bureau finds that, by classifying any of the terms appearing in the list of goods and/or services in or also in a class or classes of the International Classification in which such term was not classified in the international application as filed, the amount of the fees required is higher than if that term had not been so classified, the invitation referred to in paragraph (2)(a) or (3)(a) shall contain appropriate explanations and shall indicate that the applicant may limit the list of goods and/or services.

(b) If, within three months from the date on which the International Bureau received the international application, it receives from the applicant a statement which limits the list of goods and/or services in conformity with the formal concept of limitation as defined in the Regulations, the International Bureau shall modify the list of goods and/or services accordingly and, if such modification entails a change in the prescribed amount of the fees, such change shall be taken into account by the International Bureau in determining that amount and in applying paragraph (2)(b), (2)(c), (3)(b), (3)(c), or 3(d), as the case may be.

(5) [*Details*] (a) The Regulations shall provide for the details of the procedure under paragraphs (1) to (4).

(b) Failure to send or receive any invitation referred to in paragraphs (2) to (4), or any delay in dispatching or receiving it, or any error therein, shall not extend the time limits fixed in those paragraphs and shall not affect any obligation to decline the international application.

(c) Where the international application is declined, the International Bureau shall reimburse to the applicant such amounts as are specified in the Regulations.

(6) [*Defects Peculiar to Filings Through National Offices*] Where the international application filed through the intermediary of a national Office under Article 5(3):

(i) does not indicate that the applicant is a resident of the State through the intermediary of whose national Office the international application was filed, or

(ii) does not contain a statement by the said national Office indicating the date on which that Office received the international application, or

(iii) contains the said statement indicating a date which precedes by more than 45 days the date on which the International Bureau received the international application,

that application shall be treated as if it had been filed direct with the International Bureau on the date it reached that Bureau.

ARTICLE 8

Recording or Declining of Later Designations

(1) [*No Defects*] Subject to paragraph (2), the International Bureau shall promptly effect the recording of any later designation as requested, and the date under which such recording shall be effected ("recording date of the later designation") shall be the date on which the request for the recording of the later designation was received by the International Bureau or, in the case of a request filed through the intermediary of a national Office under Article 6(3), the date on which it was received by that Office, provided that the said request is received by the International Bureau before the expiration of 45 days from that date. The International Bureau shall issue to the owner of the international registration a certificate of the recording of the later designation.

(2) [*Defects*] (a) The provisions of Article 7(2) to (6) shall apply, *mutatis mutandis*, to the recording of later designations and declining of requests for the recording of later designations, provided that, once the international registration has been effected, any reference to the applicant shall be considered a reference to the owner of the international registration.

(b) Notwithstanding subparagraph (a), items (v) and (vi) of Article 7(2)(a) shall be considered to have been replaced by the following:

"(v) the request does not identify the international application or, once the international registration has been effected, such registration."

(c) Notwithstanding subparagraph (a), Article 7(3)(a) shall be considered to have been completed by the following:

"(iv) any list of goods and/or services contained in the request does not conform with the requirements of Article 6(2)(b), second sentence."

ARTICLE 9

Avoiding the Effects of Declining

(1) [*Requesting Redress Through Designated Office*] Where the International Bureau has declined the international application or a request for the recording of later designation, the applicant or the owner of the international registration may, within two months from the date of the notification of the declining, file with the national Office of any State designated in the declined international application or declined request:

(i) a petition for the purpose of requesting the International Bureau to proceed, in respect of that State, where the international application was declined, with the international registration and the recording of the designation of the said State or, where the request for the recording of the later designation was declined, with the recording of the designation of that State, or

(ii) an application for the registration, in the national register of marks ("national application"), of the mark that is the subject of the declined international application or declined request, in respect of all or some of the goods and/or services indicated in the said international application or the said request, such application complying with all the requirements of the national law of the said State for the filing of applications for the registration of marks in the national register of marks.

(2) [*Decision on the Request*] If the national Office or any other competent authority of the said State finds that the declining, by the International Bureau, of the international application or of the request for the recording of the later designation of that State was unjustified under this Treaty or the Regulations, or that the declining was based on the fact that there was a delay in meeting a time limit which must be excused by virtue of Article 29(1), then:

(i) where a petition has been filed under paragraph (1)(i), the said national Office shall request the International Bureau to proceed as provided in that paragraph, and the International Bureau shall proceed as requested, and the international registration date or the recording date of the later designation shall be the same as if the declining had not taken place,

(ii) where a national application has been filed under paragraph (1)(ii), that application shall, provided it complies with all the requirements of the national law of the said State for the filing of applications for the registration of marks in the national register of marks, be treated as if it had been filed on the date which would have been the international registration date or the recording date of the later designation had the declining not taken place.

(3) [*Recording of the Petition for Redress*] The applicant or the owner of the international registration who files a petition under paragraph (1)(i) shall, at the time of filing the petition, transmit a copy of that petition to the International Bureau. If the petition relates to a mark which is already registered in the International Register of Marks, the International Bureau shall, as provided in the Regulations, record and publish the fact that it has received a copy of such petition; otherwise it shall keep the said copy in its files.

ARTICLE 10

Publication and Notification

(1) [*Publication*] International registrations and recordings of later designations shall be promptly published by the International Bureau, as provided in the Regulations.

(2) [*Notification*] International registrations and recordings of later designations shall be promptly notified by the International Bureau to the national Offices of each designated State, as provided in the Regulations.

ARTICLE 11

Effects of International Registration and of Recording of Later Designation

(1) [*National Application Effect*] The international registration of a mark and the recording of any later designation, published and notified as provided in Article 10, shall have the same effect in each designated State as if an application for the registration of the mark in the national register of marks had been filed with the national Office of that State on the international registration date or on the recording date of the later designation, as the case may be.

(2) [*National Registration Effect*] Furthermore, the said international registration and recording shall, subject to Articles 12 and 13, have the same effect in each designated State as if the mark had been registered in the national register of marks of that State; such effect shall come into existence in any designated State:

(i) where no refusal or notice that a refusal may eventually be pronounced ("notice of possible refusal") has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a)(i), at the expiration of the said time limit or on such earlier date as may be prescribed by the national law of that State,

(ii) where a refusal or a notice of possible refusal has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a)(i), if and when, and to the extent to which, the refusal is reversed by a final decision or the final decision taken in the proceedings referred to in the notice of possible refusal results in acceptance of the effect provided for in this paragraph,

and shall be deemed to have started as of the international registration date or the recording date of the later designation, as the case may be.

(3) [*Several National Registers*] Where, in any designated State, there is more than one national register of marks or the national register of marks has several

parts, the reference in paragraphs (1) and (2) to the national register of marks shall be construed as a reference to that national register or that part of the national register which affords the highest degree of protection, unless another register or part of the register is indicated in the international application or the request for the recording of the later designation. In the case of such indication, the reference in paragraphs (1) and (2) to the national register of marks shall be construed as a reference to the register or part of the register so indicated.

ARTICLE 12

Refusal of the Effects Provided for in Article 11

(1) [*Grounds of Refusal*] Subject to paragraph (2) and Articles 19, 21(3) and 22(3), the effects provided for in Article 11 may, in respect of any designated State, be refused by the competent authorities of that State:

(i) on the same grounds and to the same extent as those in respect of which applications for the registration of marks in the national register of marks may be refused under the national law of the said State, provided that such grounds are not incompatible with this Treaty and the Regulations or the most recent provisions of the Paris Convention for the Protection of Industrial Property by which that State is bound, and provided that Article 6*quinquies* of the Stockholm (1967) Act of the said Convention shall apply also to marks registered under this Treaty, the international registration taking the place, for the purposes of the said Article 6*quinquies*, of registration in the country of origin,

(ii) on the ground that the owner of the international registration is not entitled to own international registrations or that the applicant was not entitled to file international applications.

(2) [*Time Limit and Other Conditions*] (a) Any refusal under paragraph (i) shall be effective only:

(i) if the refusal or notice of possible refusal is notified, as provided in the Regulations, by the national Office of the designated State to the International Bureau so that the latter receives it within 15 months or, in the case of a certification mark, 18 months from the date of the publication of the international registration, or, in the case of a later designation, of the publication of the recording of the later designation of such State, and

(ii) in the case of a refusal, if the grounds for the refusal are specified, and provided, where such refusal is not final, that the grounds given in the final decision of refusal include at least one of the grounds specified in the said refusal and the final decision is or is also based on at least one of the grounds specified in the said refusal,

(iii) in the case of a notice of possible refusal followed by a refusal, if the notice specifies, as provided in the Regulations, the grounds on which a refusal may eventually be pronounced, and provided that the grounds given in the final decision of refusal include at least one of the grounds specified in the said notice and the final decision is or is also based on at least one of the grounds specified in the said notice.

(b) The proviso of subparagraph (a)(ii) and the proviso of subparagraph (a)(iii) shall not apply where the final decision is that of a court or other independent review authority.

(c) Subparagraph (a) shall not apply where the refusal is based on lack of compliance with the requirements of the national law of the designated State permitted by Article 19(3).

(3) [*Remedies*] The owner of the international registration shall, with reasonable time limits, have in any designated State the same remedies against any decision of refusal and the same procedural and substantive rights in connection with any intended refusal, whether ex officio or based on the opposition of a third party, as have applicants who apply for the registration of marks in the national register of marks of the State in question.

(4) [*Procedural Details*] (a) The International Bureau shall record any notification received under paragraph (2)(a) and publish a corresponding notice.

(b) Where the decision of refusal is final, the national Office of the designated State shall notify the International Bureau accordingly, and that Bureau shall record the final decision, cancel the designation of that State, or, in a case where the final decision relates to some only of the goods and/or services listed, cancel in respect of the said State those goods and/or services to which the said decision relates, and publish such cancellation.

(c) Where a refusal which is not final or a notice of possible refusal has been notified under paragraph (2)(a) and the final decision results in acceptance of the effect referred to in Article 11(2), the national Office of the designated State shall notify the International Bureau accordingly, and the International Bureau shall record the notification received and publish a corresponding notice.

(d) The details of the procedures referred to in subparagraphs (a) to (c) are provided in the Regulations.

ARTICLE 13

Cancellation of the Effect Acquired Under Article 11(2)

(1) [*Grounds of Cancellation*] Subject to Article 19, the effect acquired under Article 11(2) may, in respect of any designated State, be cancelled by the competent authorities of that State:

(i) on the same grounds, to the same extent and subject to the same procedure as those in respect of which registrations of marks in the national register of marks may be cancelled under the national law of the said State, provided that such grounds and such procedure are not incompatible with this Treaty and the Regulations or the most recent provisions of the Paris Convention for the Protection of Industrial Property by which that State is bound, and provided that Article 6*quinquies* of the Stockholm (1967) Act of the Paris Convention for the Protection of Industrial Property shall apply also to marks registered under this Treaty, the international registration taking the place, for the purposes of the said Article 6*quinquies*, of registration in the country of origin,

(ii) on the ground that the owner of the international registration is not entitled to own international registrations or that the applicant was not entitled to file international applications.

(2) [*Defense and Remedies*] The competent authorities of the designated State shall give, with reasonable advance notice, an opportunity to the owner of the international registration to defend his rights in any cancellation proceeding and such owner shall have the same remedies against any decision of cancellation as have owners of marks registered in the national register of marks of the said State.

(3) [*Procedural Details*] If the decision of cancellation is final, the national Office of the designated State shall notify the International Bureau accordingly, and that Bureau shall record that decision, cancel the designation of the said State or, in a case where the cancellation relates to some only of the goods and/or services listed,

cancel—in respect of that State—those goods and/or services to which the said decision relates, and publish such cancellation.

ARTICLE 14

Change in the Ownership of the International Registration

(1)(a) [*Total or Partial Change; Request; Recording*] Where the ownership of any international registration changes so that the new owner has become the owner in respect of all or fewer than all of the designated States and in respect of all or some only of the goods and/or services, the change in ownership shall, on request, subject to paragraph (2), be recorded by the International Bureau.

(b) [*Details of the Request*] The request shall contain, as provided in the Regulations:

(i) an indication to the effect that the recording by the International Bureau of a change in ownership is requested,
(ii) the international registration number of the international registration,
(iii) indications concerning the name, residence, nationality and address of the new owner,
(iv) the identification of those of the designated States in respect of which the new owner has acquired ownership and the identification, in respect of each of those States, of those of the goods and/or services for which the new owner has acquired ownership.

(c) [*Signature*] The request shall be signed by the person who, pursuant to the change in ownership, ceases to own the international registration in respect of all or fewer than all of the designated States and in respect of all or some only of the goods and/or services ("earlier owner") or, where the earlier owner is unable to sign, by the new owner, provided that if it is signed by the new owner the request shall also contain an appropriate attestation, as provided in the Regulations, by the national Office of the Contracting State of which the earlier owner was, at the time of the change of ownership, a national or, if at that time the earlier owner was not a national of a Contracting State, by the national Office of the Contracting State of which, at the said time, the earlier owner was a resident.

(d) [*Fee; Publication; Notification*] The request shall be subject to the payment of a fee to the International Bureau, and the recording shall be published by that Bureau and notified by it to the earlier owner and the new owner and to the interested designated Offices, as provided in the Regulations.

(2) [*Declining of Request*] (a) In any of the following cases, the International Bureau shall decline the request and shall notify accordingly the person who has signed it:

(i) where the request does not contain the indication referred to in paragraph (1)(b)(i),
(ii) where the request does not contain the number referred to in paragraph (1)(b)(ii),
(iii) where the request contains no indications concerning the residence or nationality of the new owner, or only such indications as do not permit the conclusion that he is entitled to own international registrations,
(iv) where the request contains no indications concerning the identity and address of the person who has signed it or only such indications as do not permit him to be identified and reached by mail,
(v) where the request does not identify any designated State in respect of which the new owner has acquired ownership,
(vi) where the request does not identify, as provided in the Regulations, any goods and/or services in respect of each of the designated States for which the new owner has acquired ownership,
(vii) where the request is not signed and, if it is signed by the new owner, where it does not contain the attestation, as provided in the Regulations, referred to in paragraph (1)(c),
(viii) where the prescribed fee has not been received.

(b) Where the request has the defect referred to in subparagraph (a)(iv) to the extent that it makes it unlikely for the notification referred to in subparagraph (a) to reach the person who signed the request, the International Bureau is not required to send such a notification.

(3) [*Effect*] Subject to paragraph (4), any recording effected under paragraph (1) shall, from the date of such recording, have the same effect as if it had been effected in the national register of marks, or any other related register, of each of the designated States to which the request relates.

(4)(a) [*Denial of Effect: Grounds*] The competent authorities of any designated State may, as far as that State is concerned, deny the effect referred to in paragraph (3) on grounds which, according to its national law, do not allow of changes in ownership or on the ground that the new owner is not entitled to own international registrations.

(b) [*Denial of Effect: Evidence*] The national law of any Contracting State may provide that the effect referred to in paragraph (3) may, as far as such State is concerned, be denied if, within three months from the date of the publication referred to in paragraph (1)(d) or, where that national law provides for a longer period, within that period, evidence is not adduced before its national Office which satisfies the conditions of the national law as regards changes in ownership. Any national Office may collect the fee prescribed by its national law in connection with the examination of the said evidence adduced before it.

(c) [*Denial of Effect: Notification by Designated State; Recording, Notification, Publication*] Where the competent authorities of any designated State deny the effect referred to in paragraph (3), the national Office of that State shall promptly notify the International Bureau accordingly, and that Bureau shall record the denial and effect the corresponding notifications and publication. The details of the procedure are provided in the Regulations.

(5) [*Switchover to National Register Where an Owner Cannot Own International Registrations*] Where there is a change in ownership other than by contract between the earlier owner and the new owner, and where the new owner is a person who is not entitled to file international applications but is entitled under the national law of any designated State to file applications for the registration of marks in the national register of marks of that State, the new owner may file an application for the registration, in the said national register, of the mark which is registered, and in respect of all or some of the goods and/or services which are listed, in the International Register of Marks in respect of that State. If, within two years from the change in ownership and prior to six months after the expiration of the initial term of the international registration or the then running term of renewal, as the case may be, the new owner files such an application, that application shall be treated in the said State as if it had been filed at the time when the designation of that State took effect.

ARTICLE 15

Change in the Name of the Owner of the International Registration

(1) [*Recording*] Where the owner of the international registration changes his name, such change in the name

of the owner shall, on his request, be recorded by the International Bureau.

(2) [*Request*] (a) Any request may relate to several international registrations of the same owner.

(b) The request shall contain, as provided in the Regulations:

(i) an indication to the effect that the recording by the International Bureau of a change in the name of the owner of the international registration is requested,
(ii) a declaration to the effect that the change in name does not amount to a change in the ownership of the international registration,
(iii) the international registration number of the international registration,
(iv) an indication of the former name and of the new name of the owner of the international registration.

(c) The request shall be signed with the new name of the owner of the international registration.

(d) The request shall be subject to the payment of a fee to the International Bureau.

(3) [*Publication, Notification, Copies of Documents*] The recording shall be published by the International Bureau and shall be notified to the designated Offices, as provided in the Regulations.

(4) [*Declining of Request*] In any of the following cases, the International Bureau shall decline the request and shall notify accordingly the owner:

(i) where the request does not contain the indications referred to in paragraph (2)(b),
(ii) where the request is not signed as provided in paragraph (2)(c),
(iii) where the prescribed fee has not been received.

(5) [*Effect*] Subject to paragraph (6), any recording effected under paragraph (1) shall, from the date of such recording, have the same effect as if it had been effected in the national register of marks, or any other related register, of each of the designated States.

(6)(a) [*Denial of Effect: Evidence*] The national law of any Contracting State may provide that the effect referred to in paragraph (5) may, as far as such State is concerned, be denied if, within three months from the date of the publication referred to in paragraph (3)(a) or, where that national law provides for a longer period, within that period, evidence is not adduced before its national Office which proves that the natural person or legal entity designated by the former name and the new name is the same.

(b) [*Denial of Effect: Notification by Designated State; Recording, Notification, Publication*] Where the competent authorities of any designated State deny the effect referred to in paragraph (5), the national Office of that State shall promptly notify the International Bureau accordingly, and that Bureau shall record the denial and effect the corresponding notifications and publication. The details of the procedure are provided in the Regulations.

ARTICLE 16

Limitation of the List of Goods and/or Services

(1) [*Request; Recording*] On the request of the owner of the international registration, the International Bureau shall record, in respect of any designated State, any limitation of the list of goods and/or services which conforms with the formal concept of limtation as defined in the Regulations.

(2) [*Fees; Publication and Notification*] The request for recording shall be subject to the payment of a fee to the International Bureau, and the recording shall be published by that Bureau and notified to all the interested designated States, as provided in the Regulations.

(3) [*Declining of the Request*] The International Bureau shall decline the recording of any change in the list of goods and/or services which does not conform with the said formal concept of limitation or other requirements of the request, and shall notify the owner of the International Registration accordingly, as provided in the Regulations.

(4) [*Effect*] Subject to paragraph (5), any recording effected under paragraph (1) shall, from the date of such recording, have the same effect as if it had been effected in the national register of marks of each of the designated States to which the request relates.

(5)(a) [*Limitation on the Invitation of the Designated Office*] If the national Office or other competent authority of a designated State finds that the limitation requested by the owner of the international registration in respect of that State but declined by the International Bureau is, in fact, a limitation in the sense that the terms proposed in the request relate only to goods and/or services which are covered by the terms appearing in the international registration, the national Office of that State, upon petition by the owner, shall, as provided in the Regulations, invite the International Bureau to record the limitation in respect of that State.

(b) [*Reinstatement of the List of Goods and/or Services on the Invitation of the Designated Office*] If the national Office or other competent authority of a designated State finds that the limitation requested by the owner of the international registration and recorded by the International Bureau is, in fact, not a limitation in the sense indicated in subparagraph (a), the national Office of that State may, as provided in the Regulations and after having heard the owner, invite the International Bureau to reinstate, in respect of that State, wholly or in part, the list of goods and/or services as it was prior to the limitation in question.

(c) [*Procedural Details*] The International Bureau shall proceed as invited and effect, as provided in the Regulations, the corresponding recording, publication and notifications.

ARTICLE 17

Term and Renewal of the International Registration

(1) [*Initial Term*] The initial term of any international registration shall be ten years from the international registration date.

(2) [*Renewal*] (a) Any international registration may be renewed in respect of any designated State by its owner for terms of ten years.

(b) Renewal shall prolong the effects provided for in Article 11 in each designated State for the term of the renewal.

(c) Each term of renewal shall start on the day following the day on which the initial term of the international registration or the term of the last renewal expires.

(3)(a) [*Demand*] Renewal shall be the subject of a demand presented to the International Bureau as provided in the Regulations, and shall be subject to the payment of fees, as provided in the Regulations. The demand shall not be presented and the fees shall not be paid earlier than six months before, or later than six months after, the starting date of the term of renewal. If the demand is presented or the fees are received after the starting date of the term of renewal, renewal shall be subject to the payment of an additional fee ("renewal surcharge"), as provided in the Regulations, which shall be paid before the expiration of six months after the starting date of the term of renewal.

(b) [*Publication*] The International Bureau shall record and publish the renewal and shall notify each designated Office accordingly, as provided in the Regulations.

ARTICLE 18

Fees

(1) [*Fees Belonging to the International Bureau*] (a) The International Bureau shall be entitled to fees in connection with the filing of each international application, request for recording of later designations, demand for renewal, and such other operations and services as are subject, according to this Treaty or the Regulations, to the payment of fees.

(b) The Regulations fix the amounts of the fees referred to in subparagraph (a).

(2) [*Fees Belonging to the Contracting States*] Each Contracting State shall be entitled to fees ("State fees") in connection with each designation and each renewal concerning it. The State fees shall be either "individual" or "standard," according to the choice of the Contracting State. The choice shall be exercised and applied as provided in the Regulations and shall apply to all designations and renewals concerning the Contracting State.

(3) [*Individual State Fees*] (a) Subject to subparagraphs (b) to (f), the amounts of individual State fees applicable to any State shall be determined by such State.

(b) The amounts of the individual State fees shall be communicated by the national Office of the Contracting State to the International Bureau in the currency and within the time limits specified in the Regulations. They shall remain applicable for the periods specified in the Regulations.

(c) The amounts of the individual State fees may vary only according to the number of classes to which the goods and/or services listed in respect of that State belong under the International Classification and according to whether the mark is or is not a collective mark or a certification mark.

(d) Any individual State fee shall belong to the designated State in respect of which it was paid and shall be transferred to its national Office as provided in the Regulations.

(e) The amount of the individual State fee to which the Contracting State is entitled in connection with each designation concerning it ("individual State designation fee") shall not exceed the total amount of any filing, class, examination, registration and publication fees which that State prescribes in connection with an application for registration in the national register of marks.

(f) The amount of the individual State fee to which the Contracting State is entitled in connection with each renewal concerning it ("individual State renewal fee") shall not exceed the amount of the renewal fee which that State prescribes for the renewal of a registration in the national register of marks, provided that, if the latter amount relates to a period which is longer or shorter than ten years, the said limit shall be proportionately reduced or proportionately increased, as the case may be.

(4) [*Standard State Fees*] (a) The amounts of the standard State designation fee and of the standard State renewal fee shall be fixed in the Regulations.

(b) The standard State fees shall belong to the States which have chosen standard State fees. The total amount of such fees collected by the International Bureau for any given calendar year shall be distributed and transferred in the course of the following year to the national Offices of the Contracting States to which the standard State fees apply in proportion to the number of designations and renewals concerning each of them, provided that the number resulting for each Office shall be first multiplied by a coefficient, as fixed in the Regulations, based on the extent of the examination which the national law provides.

(5) [*Other Details Concerning Fees*] The Regulations give further details concerning fees and provide for the total or partial reimbursement of certain fees in certain circumstances.

ARTICLE 19

Certain National Requirements

(1) [*Fees*] Subject to Article 14(4)(b), no national Office of any designated State shall, unless acting as an independent review authority, require the payment of any fee by the applicant or the owner of the international registration in connection with the obtaining and renewing of the effects, in the said State, of international applications, international registrations, and recordings concerning such applications and registrations.

(2) [*Number of Classes and of Goods and/or Services*] No designated State may refuse or cancel the effects provided for in Article 11 merely on the grounds that its national law allows the registration of marks only in respect of a limited number of classes or a limited number of goods and/or services.

(3)(a) [*Actual Use*] The national law of any Contracting State may impose the same conditions as are applicable to marks whose registration is applied for or which are registered in the national register of marks in that State in respect of any requirement that the owner of an international registration use the mark in that State or in any other place, provided that such State shall not refuse under Article 12, cancel under Article 13, or otherwise fail to accord the effects of the international registration as defined in Article 11, on the ground that the mark has not been used at any time prior to the expiration of three years counted from the international registration date or the recording date of the later designation, as the case may be. However, the national law of any Contracting State may provide that any action for infringement based upon an international registration may be started only after the owner of such international registration has commenced the continuing use of the mark in the said State and that any remedy resulting from such action shall relate only to the period after such use has commenced.

(b) [*Actual Use: Continued*] Where, at the expiration of the three-year time limit referred to in subparagraph (a), the final decision referred to in Article 11(2)(ii) has not been made, the said time limit shall be extended until the expiration of one year counted from the date on which the effect provided for in Article 11(2) does, in fact, come into existence, provided that in no case shall any Contracting State be required to extend the said three-year time limit by more than two years. This subparagraph shall not apply to any Contracting State whose national law does not permit of such extension. Any such State shall notify the International Bureau of the provisions of its national law in this regard at the time it deposits its instrument of ratification or accession. Each Contracting State shall notify the International Bureau whenever its national law changes in regard to this subparagraph.

(c) [*Actual Use: Continued*] Where prior to the international registration date or the recording date of the later designation, as the case may be, the mark has been registered, in the name of the person who is the owner of the international registration, in the national register of marks of any designated State, or has been the subject on the part of the said person of an application for registration in that register, the proviso of subparagraph (a) and the first sentence of subparagraph (b) shall not apply to the extent that the said registration or application relates to the same goods and/or services as are listed in respect of such State in the international registration. However, where the application for registration in the national register was filed less than three years before the international registration date or the recording date of the later designation, as the case may be, the proviso of subparagraph (a) shall apply, but only during the period between such date and the expiration of the third year counted from the date on which the said application was filed. Where the three-

year time limit is extended under subparagraph (b), the preceding sentence shall be applied accordingly. The present subparagraph shall also apply where the earlier registration is one effected in the international register under the Madrid Agreement or the present Treaty.

(d) [*Declaration of Actual Use*] Where one of the conditions of the national law of the designated State referred to in subparagraph (a) consists of a requirement, general in the sense that it is applicable to all marks registered in the national register of marks of that State, that a declaration stating that the mark is or is still in use in that State must be filed with its national Office at certain points in time or in connection with each renewal or other specific event ("routine declaration"), such declaration may, in the form prescribed by the national law of that State or in the form prescribed in the Regulations, be filed with the International Bureau and shall have the same effect as if it had been filed with the national Office of that State on the date on which it was received by the International Bureau. Such declaration shall be promptly forwarded by the International Bureau to the said national Office. The said effect shall not be denied on the ground that the declaration was not accompanied by any required supporting evidence, or that the evidence accompanying it was insufficient, without the said national Office's giving the owner of the international registration an opportunity to adduce or complete before it any required evidence within not less than three months after having notified the said owner or his duly appointed representative that evidence or additional evidence is required. The present subparagraph shall not apply in inter partes and other proceedings in which the requirement is not a general one in the sense indicated above ("ad hoc requirement").

(e) [*Declaration of Actual Use: Continued*] No requirement referred to in subparagraph (d) shall be applicable prior to the expiration of the time limit under the proviso of subparagraph (a), subject, where applicable, to subparagraph (b), or subparagraph (c).

(4) [*Declaration of Intent To Use the Mark*] (a) Any Contracting State may apply its national law requiring that applicants file a declaration with its national Office to the effect that they intend to use the mark, provided that such requirement shall be considered to have been complied with if a declaration in the form specified in the Regulations to the effect that the applicant or the owner of an international registration intends to use the mark in that State is contained in the international application or request for the recording of the later designation, as the case may be.

(b) The International Bureau shall, as provided in the Regulations, notify the national Office of any designated State in respect of which a declaration under subparagraph (a) was filed with that Bureau of such declaration.

(5) [*Provisions Common to Paragraphs (3) and (4)*] Whenever paragraphs (3) and (4) refer to use of the mark by the applicant or the owner of the international registration, use by a person whose use, under the applicable national law, inures to the benefit of the applicant or the owner shall be sufficient for invoking the benefits provided for in the said paragraphs.

(6) [*Collective Marks and Certification Marks*] Any Contracting State may apply its national law requiring that where the mark is a collective mark or a certification mark the owner thereof must adduce before its national Office certain supporting documents and other evidence, including in particular the bylaws of the association or other entity owning such mark and the rules concerning the control exercised over the use of such mark.

(7) [*Representation*] No designated State shall require that the applicant or the owner of the international registration be represented by any natural person or legal entity located in that State or that, for the purpose of serving notices on such applicant or owner, an address in that State be indicated, except where, in respect of or based on the mark which is the subject of the international application or the international registration, the applicant or owner institutes or defends a proceeding before the national authorities of the said State.

(8) [*Service of Certain Notifications*] (a) The national law of any Contracting State may provide that proceedings before a national authority, including a court, in that State may, for the cancellation in that State pursuant to Article 13 of the effect provided for in Article 11(2), and for no other matter, validly be commenced against the owner of the international registration by means of service of a notification addressed to him at the International Bureau.

(b) The International Bureau shall promptly forward the said notification to the owner of the international registration by registered airmail accompanied by a postal receipt form (*avis de réception, Rückschein*).

(c) Promptly upon return to the International Bureau of the receipt form, that Bureau shall send to the party instituting the proceeding a copy, certified by that Bureau, of the said receipt form.

(d) If the receipt form showing receipt by the said owner is not received by the Internal Bureau within one month from the date of its having mailed the notification, the International Bureau shall promptly publish the notification.

(e) Any national law referred to in subparagraph (a) shall provide for a reasonable time limit for the owner of the international registration to respond to the notification and defend his rights in the proceedings. This time limit shall not be less than three months from the date of the notification.

(9) [*Certain Associations*] Article 4(5) shall be without prejudice to the application of the national law in any designated State. However, no such State shall refuse or cancel the effects provided for in Article 11 on the ground that the applicant or the owner of the international registration is an association of the kind referred to in Article 4(5) if, within two months from the date of an invitation addressed to it by the designated Office, the said association files with that Office a list of the names and addresses of all the natural persons or legal entities who or which comprise it, together with a declaration that its members are engaged in a joint enterprise. The said State may, in such a case, consider the said persons or entities as the owners of the international registration standing in the name of the said association.

(10) [*Certification of Documents Issued by the International Bureau*] Where any document issued by the International Bureau bears the seal of that Bureau and the signature of the Director General or a person acting on his behalf, no authority of any Contracting State shall require authentication, legalization or any other certification of such document, seal or signature, by any other person or authority.

ARTICLE 20

Recordings Effected by National Offices

(1) [*Notification of the International Bureau*] The national Office of any Contracting State which effects any recording in its own register of marks or in any other related register in respect of matters that may be recorded in the International Register of Marks with regard to any mark which is registered in the International Register of Marks and for which that State is a designated State shall, at the time of effecting such recording and as provided in the Regulations, notify the International Bureau of the said recording unless the recording has been

effected pursuant to a notification by the International Bureau to that national Office.

(2) [*Annotation and Publication by the International Bureau*] The International Bureau shall, as provided in the Regulations, make the appropriate annotation in the International Register of Marks and publish a notice concerning such annotation.

(3) [*Lack of Annotation and Publication*] (a) Until the said annotation and publication are effected, any recording referred to in paragraph (1) shall not be effective in respect of any third party unless such third party was actually aware of the subject matter of the said recording.

(b) Notwithstanding subparagraph (a), the national law of any Contracting State may provide that recordings in its own register referred to in paragraph (1) shall be effective in respect of the residents of that State even before the annotation and publication referred to in subparagraph (a) are effected.

ARTICLE 21

Preservation of Rights Acquired Through National Registration

(1) [*Rights Preserved*] If, at the international registration date or the recording date of the later designation, as the case may be, the owner of the international registration of a mark owns, in any designated State, a registration of the same mark in the national register of marks ("national registration"), his rights under this Treaty shall be deemed to include in respect of that State all rights, particularly any priority right, existing under the national registration, and, subject to paragraph (4), shall be deemed to continue to include them even where the national registration subsequently expires. The foregoing provision shall apply to the extent that the goods and/or services referred to in respect of the said State in the international registration are, in fact, covered by the list of goods and/or services referred to in the said national registration.

(2) [*Procedural Details*] The applicant or the owner of the international registration of a mark may, as provided in the Regulations, make a declaration stating that he owns national registrations of the same mark in certain designated States and identifying such registrations. The declaration may be included in the international application or the request for the recording of later designations or it may be filed separately. It shall, as provided in the regulations, be accompanied by a certified copy of each national registration referred to in the declaration. The International Bureau shall record and publish the declaration and shall notify the interested designated Offices accordingly, as provided in the Regulations. Those Offices shall refer to the declaration in their respective national registers of marks in connection with the said national registrations.

(3) [*Immunity Against Refusal*] (a) Where a declaration under paragraph (2) has been notified to the designated Office and the conditions referred to in paragraph (1) are complied with, and to the extent that they are complied with, the effects provided for in Article 11 may not, subject to subparagraph (b), be refused under Article 12.

(b) Where, in any designated State, there is more than one national register of marks or the national register of marks has several parts and the national registration referred to in paragraph (1) exists in a national register or a part of that register which affords less than the highest degree of protection, subparagraph (a) shall apply only if the declaration under paragraph (2) relates to a registration in the same national register or in the same part of that register.

(4) [*Expiration of the National Registration*] Where the national registration referred to in paragraph (1) expires, the rights under this Treaty shall be deemed to continue to include the rights which existed under the said national registration only where a declaration referred to in paragraph (2) has been filed not later than within one year from the expiration of the said national registration.

ARTICLE 22

Preservation of Rights Acquired Through International Registration Under the Madrid Agreement

(1) [*Rights Preserved*] If, at the international registration date or the recording date of the later designation, as the case may be, the owner of the international registration of a mark effected under this Treaty owns, in respect of any designated State, an international registration of the same mark effected under the Madrid Agreement ("Madrid Registration"), his rights under this Treaty shall be deemed to include in respect of that State all rights, particularly any priority right, existing under that Madrid registration and, subject to paragraph (4), shall be deemed to continue to include them even where the Madrid registration subsequently expires. The foregoing provision shall apply to the extent that the goods and/or services referred to in respect of the said State in the international registration under this Treaty are, in fact, covered by the list of goods and/or services referred to in respect of the said State in the Madrid registration.

(2) [*Procedural Details*] The applicant seeking the international registration of a mark under this Treaty, or the owner of the international registration of a mark under this Treaty, may, as provided in the Regulations, make a declaration stating that he owns a Madrid registration of the same mark in respect of certain designated States and identifying such registration. The declaration may be included in the international application or the request for the recording of later designations or it may be filed separately. The International Bureau shall record and publish the declaration, as provided in the Regulations.

(3) [*Immunity Against Refusal*] Where a declaration under paragraph (2) has been notified to the designated Office and the conditions referred to in paragraph (1) are complied with, and to the extent that they are complied with, the effects provided for in Article 11 may not be refused under Article 12, unless protection under the Madrid Agreement has been refused or as long as refusal under that Agreement is still possible.

(4) [*Expiration of the Madrid Registration*] Where the Madrid registration referred to in paragraph (1) expires, the rights under this Treaty shall be deemed to continue to include the rights which existed under the Madrid Agreement only where a declaration referred to in paragraph (2) has been filed not later than within one year from the expiration of the said Madrid registration.

ARTICLE 23

Preservation of the Right to Use the Madrid Agreement

Where any natural person or legal entity has the right to seek international registration under the Madrid Agreement or to renew his or its international registration under that Agreement, such right shall not be affected by this Treaty in any Contracting State party also to the Madrid Agreement.

ARTICLE 24

National Registrations Based on International Registrations

(1) [*Preservation of Rights Acquired Through International Registration*] The owner of the international registration of a mark having the effect provided for in Article 11(2) in any Contracting State may, at any time and with reference to such international registration, apply for the registration of the same mark in the national register of marks of that State, and such national registration shall, provided the requirements of the national law are complied with, be granted in that State, and the rights of the said owner under such national registration shall be deemed to include all rights, particularly any priority right, existing under the said international registration in the said State, even where the international registration subsequently expires in respect of that State. The foregoing provision shall apply to the extent that the goods and/or services listed in the said application are in fact covered by the list of goods and/or services referred to in the said international registration in respect of the said State.

(2) [*Procedural Details*] Until the expiration of the effect referred to in paragraph (1), Article 20(1) and (2) shall apply also in connection with any national registration effected under that paragraph.

ARTICLE 25

Regional Marks

(1) [*Designation Having the Effect of an Application for a Regional Mark*] (a) Where the residents or nationals of all Contracting States are given the right under a treaty providing for the registration of regional marks ("regional treaty") to file applications and obtain registrations under such regional treaty by way of this Treaty, any Contracting State party to such regional treaty may declare, as provided in the Regulations, that its designation under the Treaty shall have the same effect as if the mark had been applied for as a regional mark effective in that State.

(b) Where the international application is for a regional mark and, under the regional treaty, the applicant cannot limit his application to some only of the States party to that treaty, designation of one or more of those States shall be treated as designation of all the States party to that treaty, and withdrawal of the designation, or renunciation of the recording of the designation, or cancellation of the designation for any other reason of any such State shall have the effect of withdrawal, renunciation or cancellation with respect to the designation of all such States.

(2) [*Fees*] Where the use of this Treaty results in effects under a regional treaty, Article 18(2) to (5) shall apply *mutatis mutandis* and subject to the following provisions:

(i) The beneficiary of the fees referred to in Article 18(2) shall be the intergovernmental authority administering the regional treaty.

(ii) The choice referred to in Article 18(2) shall be exercised by the intergovernmental authority administering the regional treaty.

(iii) Where, under a regional treaty, fees vary according to the number of the States to which the effect of the regional registration extends, the amounts of individual fees may vary not only according to Article 18(3)(c) but also according to the number of the designated States party to the said regional treaty, provided that the total amount referred to in Article 18(3)(e) and the amount of the renewal fee referred to in Article 18(3)(f) shall be that of the fees prescribed in the regional treaty with respect to as many States as are designated States.

ARTICLE 26

Representation Before the International Bureau

(1) [*Possibility of Representation*] Applicants and owners of international registrations may, as provided in the Regulations, be represented before the International Bureau by any natural person or legal entity empowered by them to that effect (hereinafter referred to as "the duly appointed representative").

(2) [*Effect of Appointment*] Any invitation, notification or other communication addressed by the International Bureau to the duly appointed representative shall have the same effect as if it had been addressed to the applicant or the owner of the international registration. Any application, request, demand, declaration or other document whose signature by the applicant or the owner of the international registration is required in proceedings before the International Bureau, except the document appointing the representative or revoking his appointment, may be signed by his duly appointed representative, and any communication from the duly appointed representative to the International Bureau shall have the same effect as if it had been effected by the applicant or the owner of the international registration.

(3) [*Several Applicants or Owners*] (a) Where there are several applicants, they shall appoint a common representative. In the absence of such appointment, the applicant first named in the international application shall be considered the duly appointed representative of all the applicants.

(b) Where there are several owners of the international registration, they shall appoint a common representative. In the absence of such appointment, the natural person or legal entity first named among the said owners in the International Register of Marks shall be considered the duly appointed representative of all the owners of the international registration.

(c) Subparagraph (b) shall not apply to the extent that the owners own the international registration in respect of different designated States, or in respect of different goods and/or services, or in respect of different States and different goods and/or services.

ARTICLE 27

Conditions for and Effect of Priority Claim Contained in the International Application or in the Request for the Recording of Later Designations

The conditions for and the effect of any priority claimed in the international application or in the request for the recording of later designations shall be as provided for in respect of marks in Article 4 of the Stockholm (1967) Act of the Paris Convention for the Protection of Industrial Property.

ARTICLE 28

International Application as Possible Basis of Priority Claim

(1) [*Basis of Claim*] Any international application which is regular shall be equivalent to a regular national filing within the meaning of Article 4 of the Stockholm (1967) Act of the Paris Convention for the Protection of Industrial Property and shall be recognized as the basis of a priority claim as provided for in that Act.

(2) [*Criterion of "Regular" International Application*] For the purposes of paragraph (1), an international application shall be regarded as regular if it is adequate

to establish the date on which it was filed with the International Bureau or, where it was filed through the intermediary of a national Office, with that Office.

ARTICLE 29

Delay in Meeting Time Limits

(1) [*Delays That must Be Excused by Contracting States*] Subject to paragraph (3), any Contracting State shall, as far as that State is concerned, excuse, for reasons admitted under its national law, any delay in meeting any time limit fixed in this Treaty or the Regulations.

(2) [*Delays That May Be Excused by Contracting States*] Subject to paragraph (3), any Contracting State may, as far as that State is concerned, excuse, for reasons other than those admitted under its national law, any delay in meeting any time limit fixed in this Treaty or the Regulations.

(3) [*Delays That Cannot Be Excused*] Paragraphs (1) and (2) shall not apply to any delay in meeting any time limit provided for in Article 7(1), Article 7(6)(iii), Article 8(1) and Article 12(2)(a)(i).

(4) [*International Bureau*] The International Bureau shall not excuse delays by applicants, owners of international registrations or national Offices in meeting any time limit fixed in this Treaty and the Regulations.

ARTICLE 30

Correction of Errors of the International Bureau

(1) [*Petition for Redress*] Subject to Article 9, where, in the opinion of the applicant or the owner of the international registration, the International Bureau has, in applying the provisions of this Treaty and the Regulations, made an error which may affect the interests of such applicant or owner in respect of any designated State, the said applicant or owner may, within the time limit fixed in the Regulations, filed with the national Office of such State a petition for the purpose of requesting the International Bureau to correct the error in respect of said State.

(2) [*Redress*] If the national Office or any other competent authority of the said State finds that the International Bureau has in fact made the error which is the subject of the petition, the said national Office shall request the International Bureau to correct that error in respect of that State and the International Bureau shall proceed as requested.

(3) [*Procedure*] The applicant or the owner of the international registration who files a petition under paragraph (1) shall, at the time of filing the petition, transmit a copy of that petition to the International Bureau. If the petition relates to a mark which is already registered in the International Register of Marks, the International Bureau shall, as provided in the Regulations, record and publish the fact that it received a copy of such petition; otherwise it shall keep the said copy in its files.

(4) [*Procedure: Continued*] Where the correction requires a corresponding modification of the International Register of Marks, the International Bureau shall modify that Register accordingly. Furthermore, where the correction affects any information which has been the subject of a publication by the International Bureau, that Bureau shall publish the correction.

ARTICLE 31

Notification of Owner of International Registration

Any matter recorded by the International Bureau in respect of an international registration shall be the subject of a corresponding notification to the owner of the international registration. Details may be provided in the Regulations.

CHAPTER II: ADMINISTRATIVE PROVISIONS

ARTICLE 32

Assembly

(1) [*Composition*] (a) The Assembly shall consist of the Contracting States.

(b) The Government of each Contracting State shall be represented by one delegate, who may be assisted by alternate delegates, advisors, and experts.

(2) [*Tasks*] (a) The Assembly shall:

(i) deal with all matters concerning the maintenance and development of the Union and the implementation of this Treaty;

(ii) exercise such rights and perform such tasks as are specially conferred upon it or assigned to it under this Treaty;

(iii) give directions to the Director General concerning the preparation for revision conferences;

(iv) review and approve the reports and activities of the Director General concerning the Union, and give him all necessary instructions concerning matters within the competence of the Union;

(v) determine the program and adopt the budget of the Union, and approve its final accounts;

(vi) adopt the financial regulations of the Union;

(vii) establish such committees and working groups as it deems appropriate to facilitate the work of the Union and of its organs;

(viii) determine which States other than Contracting States and which intergovernmental and international non-governmental organizations shall be admitted to its meetings as observers;

(ix) decide upon the establishment of any agency of the International Bureau in any place outside Geneva (Switzerland) for the purpose of receiving documents and payments under this Treaty and the Regulations with the same effect as if they had been received by the International Bureau in Geneva;

(x) take any other appropriate action designed to further the objectives of the Union and perform such other functions as are appropriate under this Treaty.

(b) With respect to matters which are of interest also to other Unions administered by the Organization, the Assembly shall make its decisions after having heard the advice of the Coordination Committee of the Organization.

(3) [*Representation*] A delegate may represent, and vote in the name of, one State only.

(4) [*Vote*] Each Contracting State shall have one vote.

(5) [*Quorum*] (a) One-half of the Contracting States shall constitute a quorum.

(b) In the absence of the quorum, the Assembly may make decisions but, with the exception of decisions concerning its own procedure, all such decisions shall take effect only if the quorum and the required majority are attained through voting by correspondence as provided in the Regulations.

(6) [*Majority*] (a) Subject to Article 34(5)(f), Article 35(2)(b) and (c), and Article 38(2)(b), the decisions of the Assembly shall require a majority of the votes cast.

(b) Abstentions shall not be considered as votes.

(7) [*Sessions*] (a) The Assembly shall meet once in every calendar year in ordinary session upon convocation by the Director General, preferably during the same period and at the same place as the Coordination Committee of the Organization.

(b) The Assembly shall meet in extraordinary session upon convocation by the Director General, either on the Director General's own initiative or at the request of one-fourth of the Contracting States.

(8) [*Rules of Procedure*] The Assembly shall adopt its own rules of procedure.

ARTICLE 33

International Bureau

(1) [*Tasks*] The International Bureau shall:

(i) perform the administrative tasks concerning the Union; in particular, it shall perform such tasks as are specially assigned to it under this Treaty or by the Assembly;

(ii) provide the secretariat of revision conferences, of the Assembly, of the committees and working groups established by the Assembly, and of any other meeting convened by the Director General and dealing with matters of concern to the Union.

(2) [*Director General*] The Director General shall be the chief executive of the Union and shall represent the Union.

(3) [*Meetings Other Than Sessions of the Assembly*] The Director General shall convene any committee and working group established by the Assembly and all other meetings dealing with matters of concern to the Union.

(4) [*Role of International Bureau in the Assembly and Other Meetings*] (a) The Director General and any staff member designated by him shall participate, without the right to vote, in all meetings of the Assembly, the committees and working groups established by the Assembly, and any other meeting convened by the Director General and dealing with matters of concern to the Union.

(b) The Director General or a staff member designated by him shall be ex officio secretary of the Assembly, and of the committees, working groups and other meetings referred to in subparagraph (a).

(5) [*Revision Conferences*] (a) The Director General shall, in accordance with the directions of the Assembly, make the preparations for revision conferences.

(b) The Director General may consult with intergovernmental and international non-governmental organizations concerning the said preparations.

(c) The Director General and persons designated by him shall take part, without the right to vote, in the discussions at revision conferences.

(d) The Director General or a staff member designated by him shall be ex officio secretary of any revision conference.

(6) [*Assistance by National Offices*] The Regulations may specify the services that national Offices shall render in order to assist the International Bureau in carrying out its tasks under this Treaty.

ARTICLE 34

Finances

(1) [*Budget*] (a) The Union shall have a budget.

(b) The budget of the Union shall include the income and expenses proper to the Union, its contribution to the budget of expenses common to the Unions, and any sum made available to the budget of the Conference of the Organization.

(c) Expenses not attributable exclusively to the Union but also to one or more other Unions administered by the Organization shall be considered as expenses common to the Unions. The share of the Union in such common expenses shall be in proportion to the interest the Union has in them.

(2) [*Coordination with Other Budgets*] The budget of the Union shall be established with due regard to the requirements of coordination with the budgets of the other Unions administered by the Organization.

(3) [*Sources of Income*] The budget of the Union shall be financed from the following sources:

(i) fees and other charges due for services rendered by the International Bureau in relation to the Union;

(ii) sale of, or royalties on, the publications of the International Bureau concerning the Union;

(iii) gifts, bequests, and subventions;

(iv) rents, interests, and other miscellaneous income.

(4)(a) [*Self-Supporting Financing*] The amounts of fees and charges due to the International Bureau and the prices of its publications shall be so fixed that they should, under normal circumstances, be sufficient to cover the expenses of the International Bureau connected with the administration of this Treaty.

(b) [*Continuation of Budget; Reserve Fund*] If the budget is not adopted before the beginning of a new financial period, it shall be at the same level as the budget of the previous year, as provided in the financial regulations. If the income exceeds the expenses, the difference shall be credited to a reserve fund.

(5) [*Working Capital Fund*] (a) The Union shall have a working capital fund which shall be constituted by a single payment made by each Contracting State. If the fund becomes insufficient, the Assembly shall arrange to increase it. If part of the fund is no longer needed, it shall be reimbursed.

(b) The amount of the initial payment of each Contracting State to the said fund or of its participation shall be proportionate to the number of international applications which, among the total number of such applications, it is estimated that its residents will file. The participations of all Contracting States in the fund may be revised from time to time by the Assembly to make them correspond to the number of international applications actually filed by the residents of the various States since the date of the initial payments or the last such revision.

(c) The proportion and the terms of payment shall be fixed by the Assembly on the proposal of the Director General and after it has heard the advice of the Coordination Committee of the Organization.

(d) If loans from the reserve fund permit the constitution of a working capital fund that is sufficient, the Assembly may suspend the application of subparagraphs (a), (b) and (c).

(e) Any reimbursement under subparagraph (a) shall be proportionate to the amounts paid by each Contracting State, taking into account the dates at which they were paid.

(f) Any decision under subparagraphs (a) to (d) shall require two-thirds of the votes cast.

(6) [*Advances by Host Country*] (a) In the headquarters agreement concluded with the State on the territory of which the Organization has its headquarters, it shall be provided that, whenever the working capital fund is insufficient, such State shall grant advances. The amount of those advances and the conditions on which they are granted shall be the subject of separate agreements, in each case, between such State and the Organization. As long as it remains under the obligation to grant advances, such State shall have an ex officio seat in the Assembly if it is not a Contracting State.

(b) The State referred to in subparagraph (a) and the Organization shall each have the right to denounce the obligation to grant advances, by written notification. Denunciation shall take effect three years after the end of the year in which it has been notified.

(7) [*Auditing of Accounts*] The auditing of the accounts shall be effected by one or more of the Contracting States or by external auditors, as provided in the finan-

cial regulations. They shall be designated, with their agreement, by the Assembly.

ARTICLE 35

Regulations

(1) [*Adoption of Regulations*] The Regulations adopted at the same time as this Treaty are annexed to this Treaty.

(2) [*Amending the Regulations*] (a) The Assembly may amend the Regulations. Amendments may consist also of new provisions added to the Regulations concerning:

(i) matters in respect of which this Treaty expressly refers to the Regulations or expressly provides that they are or shall be prescribed,

(ii) any administrative requirements, matters or procedures,

(iii) any details useful in the implementation of this Treaty.

(b) Subject to subparagraphs (c) and (d), the amendment of the Regulations shall require two-thirds of the votes cast.

(c) The amendment of any provision of the Regulations affecting the amount of the fees referred to in Article 18(2), as well as the distribution among the national Offices and the transfer to them of such fees, shall require three-fourths of the votes cast. Where the amendment relates to fees referred to in Article 18(2) but those fees are fees to which only some of the Contracting States are entitled, only the Contracting States entitled thereto shall, for the purposes of the quorum, be considered Contracting States, and only they shall have the right to vote.

(d) The amendment of any provisions of the Regulations concerning declarations of intent to use the mark and declarations of actual use of the mark shall require that it be accepted by a majority of two-thirds of the votes cast and that no Contracting State whose national law allows or requires the filing of such declarations vote against the proposed amendment.

(3) [*Conflict Between the Treaty and the Regulations*] In the case of conflict between the provisions of this Treaty and those of the Regulations, the former shall prevail.

ARTICLE 36

Search Service

(1) [*Tasks*] The International Bureau shall maintain a Service whose task shall be to search for anticipations among marks registered under this Treaty, and, to the extent authorized by the Assembly, other marks as well.

(2) [*Fees; Availability*] Searches shall be made on request and shall be subject to the payment of fees fixed under the Regulations. The Service shall be at the disposal of any Government, national Office, other legal entity, or natural person.

(3) [*Self-Supporting Financing*] The amounts of the fees referred to in paragraph (2) shall be so fixed that they should be sufficient to cover the expenses of the International Bureau connected with the Service.

CHAPTER III: REVISION AND AMENDMENT

ARTICLE 37

Revision of the Treaty

(1) [*Revision Conferences*] This Treaty may be revised from time to time by conferences of the Contracting States.

(2) [*Convocation*] The convocation of any revision conference shall be decided by the Assembly.

(3) [*Provisions That Can Be Amended Also by the Assembly*] The provisions referred to in Article 38(1)(a) may be amended either by a revision conference or according to Article 38.

ARTICLE 38

Amendment of Certain Provisions of the Treaty

(1) [*Proposals*] (a) Proposals for the amendment of the length of any time limit fixed in Chapter I of this Treaty, other than those referred to in Articles 12(2) and 19(3), or for any amendment to Articles 32(5) and (7), 33, 34 and 36, may be initiated by any Contracting State or by the Director General.

(b) Such proposals shall be communicated by the Director General to the Contracting States at least six months in advance of their consideration by the Assembly.

(2) [*Adoption*] (a) Amendments to the provisions referred to in paragraph (1) shall be adopted by the Assembly.

(b) Adoption shall require three-fourths of the votes cast, provided that adoption of any amendment of the length of the time limit fixed in Articles 7(1), 7(3)(c), 7(6)(iii) and 8(1) shall require that no Contracting State vote against the proposed amendment.

(3) [*Entry Into Force*] (a) Any amendment to the provisions referred to in paragraph (1) shall enter into force one month after written notifications of acceptance, effected in accordance with their respective constitutional processes, have been received by the Director General from three-fourths of the Contracting States members of the Assembly at the time the Assembly adopted the amendment.

(b) Any amendment to the said Articles thus accepted shall bind all the Contracting States which were Contracting States at the time the amendment was adopted by the Assembly, provided that any amendment increasing the financial obligations of the said Contracting States shall bind only those which have notified their acceptance of such amendment.

(c) Any amendment which has been accepted and which has entered into force in accordance with subparagraph (a) shall bind all States which become Contracting States after the date on which the amendment was adopted by the Assembly.

CHAPTER IV: FINAL PROVISIONS

ARTICLE 39

Becoming Party to the Treaty

(1) [*Ratification, Accession*] Any State member of the International Union for the Protection of Industrial Property may become party to this Treaty by:

(i) signature followed by the deposit of an instrument of ratification, or

(ii) deposit of an instrument of accession.

(2) [*Deposit of Instrument*] Instruments of ratification or accession shall be deposited with the Director General.

(3) [*Reference to Other States*] (a) Any instrument of ratification or accession may be accompanied by a declaration to the effect that it shall be considered to have been deposited only when another State, or either one of two other States, or both of two other States, specified by name, shall have deposited instruments of ratification or accession. The instrument of ratification or

accession of any State having made such a declaration shall be considered to have been deposited

(i) on the day on which the specified State, or one of the two specified States, or the second specified State, as the case may be, deposits its instrument of ratification or accession,

(ii) where the instrument of ratification or accession of any specified State itself is accompanied by a declaration concerning other States, on the day on which the instrument of ratification or accession of the said specified State is to be considered to have been deposited.

(b) Any declaration made under subparagraph (a) may be withdrawn at any time or, if it was made in respect of two States, may be limited to one of them. The instrument of ratification or accession of any State withdrawing its declaration shall be considered to have been deposited on the day on which the withdrawal is notified to the Director General, whereas the instrument of ratification or accession of any State limiting its declaration shall be considered to have been deposited on the day on which the remaining State deposits its instrument of ratification or accession. If the instrument of ratification or accession of the remaining State has already been deposited, the instrument of ratification or accession of the State limiting its declaration shall be considered to have been deposited on the day on which the limitation is notified to the Director General.

(4) [*Certain Territories*] (a) The provisions of Article 24 of the Stockholm (1967) Act of the Paris Convention for the Protection of Industrial Property shall apply to this Treaty.

(b) Subparagraph (a) shall in no way be understood as implying the recognition or tacit acceptance by a Contracting State of the factual situation concerning a territory to which this Treaty is made applicable by another Contracting State by virtue of the said subparagraph.

ARTICLE 40

Transitional Provisions

(1) [*Declaration by Certain Developing Countries*] Any State party to the Paris Convention for the Protection of Industrial Property but not party to this Treaty which, in conformity with the established practice of the General Assembly of the United Nations, is regarded as a developing country may make a declaration addressed to the Director General stating that it wishes to avail itself of the right provided for in paragraph (2) and that it intends to become party to this Treaty at the latest within two years from the date on which that right, according to the applicable provisions of paragraphs (5) to (8), ceases to be effective in respect of that State.

(2) [*Effect of Declaration*] Residents and nationals of any State having made a declaration according to paragraph (1) shall, notwithstanding Article 4(1), have the right to file international applications and to own international registrations under this Treaty.

(3) [*Time of Filing Declaration*] The declaration referred to in paragraph (1) shall be filed with the Director General at any time before June 12, 1978.

(4) [*Commencement of Effect*] If filed before the entry into force of this Treaty according to Article 41(1), the declaration referred to in paragraph (3) shall become effective on the date of the said entry into force. If filed after such entry into force, the said declaration shall become effective three months after the date of its filing.

(5) [*Expiration of Effect*] Subject to paragraphs (6) to (8), the right provided for in paragraph (2) shall be effective until the expiration of whichever of the following two periods expires later:

(i) a period of ten years from the date (June 12, 1973) of the signature of this Treaty,

(ii) a period of five years from the entry into force of this Treaty according to Article 41(1).

(6) [*Possible Prolongation of Effect*] (a) The period referred to in paragraph (5) may be prolonged twice for periods of five years each by decisions of the Special Conference as defined in subparagraph (b) in respect of those States having made the declaration referred to in paragraph (1) whose residents or nationals have filed an average of not more than two hundred international applications per year during the three consecutive years, as defined in subparagraph (d).

(b) The Special Conference shall consist of the States which, at the time it meets, are Contracting States and those States having made a declaration under paragraph (1) which fulfill, in respect of the number of international applications, the conditions set forth in subparagraph (a).

(c) The decision of the Special Conference shall require a simple majority of the votes cast. The said Conference shall meet upon convocation by the Director General during the year preceding the year in which:

(i) the period referred to in paragraph (5) expires, and

(ii) the first five-year period referred to in subparagraph (a) expires if prolongation for that period had been decided.

(d) The three consecutive years referred to in subparagraph (a) shall, in respect of each of the two possible decisions, be the fourth, third and second calendar years before the year in which the decision is made.

(7) [*Possible Further Prolongation of Effect*] The Assembly, in exceptional cases and upon request, may decide to prolong for two further periods of five years each the application of the right under paragraph (2) in respect of any State which, at the time the decision is made, benefits from the said right and which is then regarded as one of the least developed among the developing countries.

(8) [*Termination of Effect for Special Reasons*] Notwithstanding paragraphs (4) to (7), the right provided for in paragraph (2) shall cease to exist on the last day of the calender year which follows the year in which any State having made a declaration under paragraph (1):

(i) ceases to be regarded as a developing country in conformity with the established practice of the General Assembly of the United Nations, or

(ii) denounces the Paris Convention for the Protection of Industrial Property.

ARTICLE 41

Entry Into Force of the Treaty

(1) [*Initial Entry Into Force*] This Treaty shall enter into force six months after five States have deposited their instruments of ratification or accession.

(2) [*States Not Covered by the Initial Entry Into Force*] Any State which is not among those referred to in paragraph (1) shall become bound by this Treaty three months after the date on which it has deposited its instrument of ratification or accession.

ARTICLE 42

Reservations to the Treaty

Subject to Article 46(2), no reservations to this Treaty are permitted.

ARTICLE 43

Denunciation of the Treaty

(1) [*Notification*] Any contracting State may denounce this Treaty by notification addressed to the Director General.

(2) [*Effective Date*] Denunciation shall take effect one year after the day on which the Director General has received the notification.

(3) [*Moratorium on Denunciation*] The right of denouncing this Treaty provided for in paragraph (1) shall not be exercised by any Contracting State before the expiration of five years from the date on which it becomes bound by this Treaty.

(4) [*Continuation of the Effects of the Treaty*] (a) The effects of this Treaty on any mark enjoying the benefits of this Treaty on the day preceding the day on which the denunciation by any Contracting State takes effect shall continue in that State until the expiration of the initial or renewal term which was running on that date.

(b) Where the right to own the international registration of a mark is based on the owner's being a resident or national of the Contracting State referred to in subparagraph (a), the benefits of this Treaty shall, in all designated States, continue until the day on which the period referred to in subparagraph (a) expires in respect of that mark.

ARTICLE 44

Signature and Languages of the Treaty

(1) [*Original Texts*] This Treaty shall be signed in a single original in the English and French languages, both texts being equally authentic.

(2) [*Official Texts*] Official texts shall be established by the Director General, after consultation with the interested Governments, in the German, Italian, Japanese, Portuguese, Russian and Spanish languages, and such other languages as the Assemby may designate.

(3) [*Time Limit for Signature*] This Treaty shall remain open for signature at Vienna until December 31, 1973.

ARTICLE 45

Depositary Functions

(1) [*Deposit of the Original Texts*] The original of this Treaty, when no longer open for signature, shall be deposited with the Director General.

(2) [*Certified Copies*] The Director General shall transmit two copies, certified by him, of this Treaty to the Governments of the States party to the Paris Convention for the Protection of Industrial Property and, on request, to the Government of any other State.

(3) [*Registration of the Treaty*] The Director General shall register this Treaty with the Secretariat of the United Nations.

(4) [*Amendments*] The Director General shall transmit two copies, certified by him, of any amendment to this Treaty to the Governments of the Contracting States and, on request, to the Government of any other State.

ARTICLE 46

Settlement of Disputes

(1) [*International Court of Justice*] Any dispute between two or more Contracting States concerning the interpretation or application of this Treaty or the Regulations, not settled by negotiation, may, by any one of the States concerned, be brought before the International Court of Justice by application in conformity with the Statute of the Court, unless the States concerned agree on some other method of settlement. The Contracting State bringing the dispute before the Court shall inform the International Bureau; the International Bureau shall bring the matter to the attention of the other Contracting States.

(2) [*Reservation*] Each Contracting State may, at the time it signs this Treaty or deposits its instrument of ratification or accession, declare by notification deposited with the Director General that it does not consider itself bound by paragraph (1). With regard to any dispute between any Contracting State having made such a declaration and any other Contracting State, paragraph (1) shall not apply.

(3) [*Withdrawal of Reservation*] Any Contracting State having made a declaration in accordance with paragraph (2) may, at any time, withdraw its declaration by notification addressed to the Director General.

ARTICLE 47

Notifications

The Director General shall notify the Governments of the States party to the Paris Convention for the Protection of Industrial Property of:

(i) signatures under Article 44;
(ii) deposits of instruments of ratification or accession under Article 39(2) and of any declaration accompanying them under Article 39(3)(a) and any withdrawal or limitation of such declarations made under Article 39(3)(b);
(iii) the date of entry into force of this Treaty under Article 41(1) and any amendment under Article 38(3)(a);
(iv) denunciations received under Article 43;
(v) declarations received under Articles 40(1) and 46(2) and (3).

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REGULATIONS

UNDER THE TRADEMARK REGISTRATION TREATY

RULE 1

Abbreviated Expressions

1.1 *"Treaty"*

In these Regulations, the word "Treaty" means the Trademark Registration Treaty.

1.2 *"Chapter" and "Article"*

In these Regulations, the words "Chapter" and "Article" refer to the specified Chapter or Article of the Treaty.

1.3 *Associations*

In these Regulations, references to legal entities where such references concern them in their capacity of appli-

cants or owners of international registrations shall be construed as references also to associations referred to in Article 4(5).

1.4 *"Gazette"*

In these Regulations, the word "Gazette" means the official Gazette of the International Bureau referred to in Article 2(ix).

1.5 *"Table of Fees"*

In these Regulations, the words "Table of Fees" mean the table of fees annexed hereto.

RULES CONCERNING CHAPTER I

RULE 2

Representation Before The International Bureau

2.1 *Number of Duly Appointed Representatives*

(a) The applicant and the owner of the international registration may appoint only one representative.

(b) Where several natural persons or legal entities have been indicated as representatives by the applicant or the owner of the international registration, the natural person or legal entity first mentioned in the document in which they are indicated shall be regarded as the only duly appointed representative.

(c) Where the representative is a partnership or firm composed of attorneys or patent or trademark agents, it shall be regarded as one representative.

2.2 *Form of Appointment*

(a) A representative shall be regarded as a "duly appointed representative" if his appointment complies with the prescriptions of paragraphs (b) to (e).

(b) The appointment of any representative shall require:

(i) that his name appear as that of a representative in the international application and that such application bear the signature of the applicant, or

(ii) that a separate power of attorney (i.e., a document appointing the representative), signed by the applicant or the owner of the international registration, be filed with the International Bureau.

(c) Where there are several applicants or owners of the international registration, the document containing or constituting the appointment of their common representative shall be signed by all of them.

(d) Any document containing or constituting the appointment of a representative shall indicate his name and his address. Where the representative is a natural person, his name shall be indicated by his family name and given name(s), the family name being indicated before the given name(s). Where the representative is a legal entity or a partnership or firm of attorneys or patent or trademark agents, "name" shall mean the complete name of the legal entity or partnership or firm. The address of the representative shall be indicated in the same manner as that provided for in respect of the applicant in Rule 5.2(c).

(e) The document containing or constituting the appointment shall contain no words which, contrary to Article 26(2), would limit the powers of the representative, in particular by indicating a time limit or event after which the appointment would expire, by excluding certain matters from the powers of the representative, or by specifying some only of the powers which any representative has under the said Article.

(f) Where the appointment does not comply with the requirements referred to in paragraphs (b) to (e), it shall be treated by the International Bureau as if it had not been made, and the applicant or the owner of the international registration as well as the natural person, the legal entity, the partnership or firm which was indicated as the representative in the purported appointment shall be informed of this fact by the International Bureau.

(g) The Administrative Instructions shall provide recommended wording for the appointment.

2.3 *Revocation or Renunciation of Appointment*

(a) The appointment of any representative may be revoked at any time by the natural person who or legal entity which has appointed that representative. The revocation shall be effective even if only one of the natural persons who or legal entities which have appointed the representative revokes the appointment.

(b) Revocation shall require a written document signed by the natural person or the legal entity referred to in the preceding paragraph. It shall be effective, as far as the International Bureau is concerned, as from the date of the receipt of the said document by that Bureau.

(c) The appointment of a representative as provided in Rule 2.2 shall be regarded as the revocation of any earlier appointment of any other representative. The appointment shall preferably indicate the name of the other earlier appointed representative.

(d) Any representative may renounce his appointment through a notification signed by him and addressed to the International Bureau.

2.4 *General Powers of Attorney*

The appointment of a representative in a separate power of attorney (i.e., a document appointing the representative) may be general in the sense that it relates to more than one international application and more than one international registration in respect of the same natural person or legal entity. The identification of such applications and registrations, as well as other details in respect of such general power of attorney and of its revocation or renunciation, shall be provided in the Administrative Instructions. The Administrative Instructions may provide for a fee payable in connection with the filing of general powers of attorney.

2.5 *Substitute Representative*

(a) The appointment of the presentative referred to in Rule 2.2(b) may indicate also one or more natural persons as substitute representatives.

(b) For the purposes of the second sentence of Article 26(2), substitute representatives shall be considered as representatives.

(c) The appointment of any substitute representative may be revoked at any time by the natural person who or legal entity which has appointed the representative or by the representative. Revocation shall require a written document signed by the said natural person, legal entity or representative. It shall be effective, as far as the International Bureau is concerned, as from the date of the receipt of the said document by that Bureau.

RULE 3

International Register of Marks

3.1 *Contents of the International Register*

The International Register of Marks shall contain, in respect of each mark registered therein:

(i) all the indications that must or may be furnished under the Treaty or these Regulations, and that have in fact been furnished, to the International Bureau, and, where relevant, the date on which such indications were received by that Bureau,

(ii) the amount of all fees received and the date or dates on which they were received by the International Bureau,

(iii) the number and date of the international registration and the numbers, if any, and the dates of all recordings relating to that registration.

3.2 *Keeping of the International Register*

The administrative Instructions shall regulate the establishment of the International Register of Marks, and, subject to the Treaty and these Regulations, shall specify the form in which it shall be kept and the procedure which the International Bureau shall follow for inscribing recordings therein and for preserving it from loss or other damage.

RULE 4

Applicant

4.1 *The Same Applicant for All Designated States*

(a) The applicant shall be the same for the purposes of all the designated States.

(b) Where the international application, as filed, does not indicate the same applicant for the purposes of all the designated States, that application shall be treated as if only the state first mentioned therein, and any other State for the purposes of which the same applicant is indicated as for the said first-mentioned state, had been designated.

RULE 5

Mandatory Contents of the International Application

5.1 *Indication that the International Application is Filed Under the Treaty*

The indication referred to in Article 5(1)(a)(i) shall be worded as follows: "The undersigned requests that the mark herein reproduced be registered in the International Register of Marks established under the Trademark Registration Treaty"; or it shall consist of a statement to the same effect.

5.2 *Indications Concerning the Applicant*

(a) The applicant's identity shall be indicated by his name. If the applicant is a natural person, his name shall be indicated by his family name and given name(s), the family name being indicated before the given name(s). If the applicant is a legal entity, its name shall be indicated by the full, official designation of the said entity.

(b) The applicant's residence and nationality shall be indicated by the name(s) of the State(s) of which he is a resident and of which he is a national.

(c) The applicant's address shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and shall, in any case, consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. Any telegraphic and teletype address and telephone number that the applicant may have should preferably be indicated. For each applicant, only one address shall be indicated; if several addresses are indicated, only the one first mentioned in the international application shall be considered.

5.3 *Reproduction of the Mark; Color; Transliteration*

(a) Where the mark consists only of letters of the Latin alphabet, Arabic or Roman numerals, and punctuation signs usual in connection with the Latin alphabet, and the applicant does not wish to claim any special graphic feature, the mark may be reproduced, for example by typing the letters, numerals and signs, on the sheet itself on which the international application appears. The use of small letters and capital letters shall be permitted, and shall be followed in the publications of the International Bureau.

(b) In cases other than that referred to above, the mark shall be reproduced on a sheet of paper of A4 size (29.7 cm. x 21 cm.), separate from the sheet on which the text of the international application appears, and shall be attached to the latter sheet. The reproduction of the mark itself on the separate sheet shall not occupy a space larger than 10 centimeters horizontally and 10 centimeters vertically. The reproduction of the mark on the separate sheet shall be of a quality admitting of direct reproduction by photography and printing processes. The separate sheet shall indicate the name and address of the applicant.

(c) Where color is claimed, the international application shall contain a statement to that effect and shall be accompanied by

(i) either a reproduction of the mark in color in one copy satisfying the requirements set forth in paragraph (b),

(ii) or a reproduction of the mark in color in the number of copies fixed in the Administrative Instructions and a reproduction of the mark in black and white in one copy containing a description of the colors in words and signs as specified in the Administrative Instructions, all copies satisfying the requirements set forth in paragraph (b).

(d) Where the mark or a certain part of it is three-dimensional, the international application and the separate sheet containing the reproduction of the three-dimensional feature shall contain an indication to that effect.

(e) Where the mark is intended to be used, or also to be used, as a sound mark, the international application and any separate sheet containing the reproduction of the mark shall contain an indication to that effect.

(f) Where the mark consists of or contains matter in script other than Latin script or numbers expressed in forms other than Arabic or Roman, the international application shall also contain a transliteration of such matter in Latin script and Arabic numerals; the transliteration shall follow the English pronunciation if the international application is in English, and the French pronunciation if it is in French. If the International Bureau finds that such transliteration is incorrect or is missing and it is equipped to effect itself the said transliteration, it shall do so. In the latter case, however, it shall notify the applicant of its transliteration and invite him to make comments on it within one month from the date of the notification, and shall not proceed with the international registration before the expiration of the said period of one month.

5.4 *List of Goods and/or Services*

(a) Each of the groups of terms pertaining to the same class of the International Classification shall be preceded by an indication of the number of the class, and the various groups shall follow in the numerical order of the corresponding classes.

(b) If, in the list of goods and/or services contained in the international application as filed, the terms are not or not properly grouped as provided in Article 5(1)(a)(iv), the International Bureau shall, after having notified the applicant of its intention to do so and allowing him one month from the date of the notification to react to such notification, classify each term as required and constitute the required groups. If any of the terms does not permit classification in one class only of the International Classification, it shall be classified in each of the applicable classes.

(c) If the International Bureau finds that any term is incomprehensible, it shall notify the applicant of its finding and allow him one month from the date of the notification to submit either arguments to the effect that the term is comprehensible or a request that the incomprehensible term be deleted. If, on the basis of the said arguments or other considerations, the International Bureau finds that the term is comprehensible, it shall treat it according to its comprehended meaning. Otherwise it shall delete it ex officio.

(d) The list of goods and/or services shall be the same for the purposes of all States designated in the international application as filed or as limited under Article 7(4)(b). Where the international application as filed or as limited under Article 7(4)(b) indicates different goods and/or services in respect of different designated States, that application shall be treated as if only the State first mentioned therein, and any other States for the purposes of which the same list of goods and/or services is indicated as for the said first-mentioned State, had been designated.

5.5 Identification of States

(a) Identification of any State shall consist in writing its name in the international application in a manner sufficiently clear for the purposes of identification.

(b) The identification of any designated State which is not a Contracting State shall be treated as if such State had not been identified.

5.6 Choice Between National and Regional Marks

(a) The availability of any choice referred to in Article 5(1)(a)(vi) shall be notified by the interested Contracting State to the International Bureau, and that Bureau shall publish a corresponding announcement.

(b) The choice referred to in Article 5(1)(a)(vi) shall be indicated by the words "national mark desired" or 'regional mark desired," respectively, or by other words to that effect, appearing next to the name of the designated State to which the choice applies.

5.7 Collective Marks and Certification Marks

The indication referred to in Article 5(1)(a)(vii) shall consist of the words "collective mark desired" or "certification mark desired," respectively, or other words to that effect, appearing next to the name of the designated State to which the indication applies.

5.8 Application Filed Through the Intermediary of a National Office

(a) The indication referred to in Article 5(3)(b) shall be worded as follows: "The . . . ① certifies that the present international application was filed with it on . . . ②."

① Indicate the name of the national Office. ② Indicate the date.

(b) The national Office of any Contracting State whose national law provides that international applications of residents of that State may be filed through the intermediary of the national Office of the said State shall, at least once a week, send to the International Bureau a note containing the following indications concerning each of the international applications filed with it since the sending of the last such note.

(i) the name of the applicant,
(ii) a reproduction of the mark,
(iii) the date on which the international application was filed with that Office,
(iv) the date on which the international application was mailed to the International Bureau.

(c) The notes referred to in paragraph (b) shall be numbered consecutively.

(d) If the International Bureau does not receive any of the international applications listed in any note within 15 days from the date on which it received such note, it shall inform the national Office accordingly.

RULE 6

Optional Contents of the International Application

6.1 Naming of a Representative

The international application may indicate a representative.

6.2 Claiming of Priority

(a) The declaration referred to in Article 5(1)(b) shall consist of a statement to the effect that the priority of an earlier application is claimed and shall indicate:

(i) where the earlier application is an application filed for the registration of a mark in the register of marks of a given country, the country in which it was filed; where the earlier application is an internationnal application filed under the Treaty, a State designated therein; where the earlier application is an application for a regional mark, the authority with which it was filed and a State for which it was filed;
(ii) the date on which the earlier application was filed;
(iii) the number allotted to the earlier application.

(b) If the declaration does not indicate the country or State, and the date, referred to in paragraph (a)(i) and (ii), the International Bureau shall treat the declaration as if it had not been made.

(c) If the application number referred to in paragraph (a)(iii) is not indicated in the declaration but is furnished by the applicant or the owner of the international registration to the International Bureau prior to the expiration of the 10th month from the filing date of the said application, it shall be considered to have been included in the declaration and shall be published by the International Bureau.

6.3. Declaration of Intent To Use the Mark

(a) Any declaration made under Article 19(4)(a) shall consist of the following statement:

> "The undersigned applicant declares that (he) (it) intends to use the mark which is the subject of this international application himself (itself) and/or by and through persons whose use inures to his (its) benefit in commerce with and/or on the territory of . . . ① on and/or in connection with the goods and/or services listed in this international application."

① If the declaration relates to all the States designated in the international application, insert "each of the States designated in this application"; otherwise, indicate those of the States designated in respect of which the declaration is made.

(b) It shall depend on the national law of each designated State whether any declaration to the same effect as but worded differently than in paragraph (a) shall produce the effect provided for in Article 19(4)(a) in that State.

6.4 Declaration of Actual Use

In respect of any designated State, the following statement, signed by the applicant, may be made and attached to the international application:

> "The undersigned applicant declares that the following mark . . . ① which is the subject of the international application to which this declaration is attached is now in use by and through . . . ② in

commerce with and/or on the territory of . . . ③ on or in connection with the following goods and/or services listed in respect of such State . . . ④; that such use commenced on . . . ⑤; and that the mode and manner in which the mark is used is:

- ☐ on labels or tags affixed to and/or containers for the goods, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
- ☐ on displays which are associated with the goods, as evidenced by the attached specimen(s) or fascimile(s) ⑥;
- ☐ in the case of services, in advertising of such services, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
- ☐ other ⑦."

① Reproduce the mark. ② Insert "the undersigned applicant" and/or, if applicable, the name and address of the person or persons whose use of the mark inures to the benefit of the applicant in the State. ③ Insert name of State. ④ Insert "all" or indicate the particular goods and/or services on or in connection with which the mark is used. ⑤ Insert the date of commencement of the continuing use of the mark, including, where different dates are applicable to different goods and/or services, the particular goods and/or services to which each such date relates. ⑥ The inclusion of specimens or facsimiles may be dispensed with where the declaration is made in respect of a State whose national law does not require that specimens or facsimiles be attached to routine declarations of actual use. ⑦ Recite sufficient facts in addition to, or in lieu of, checking one or more of the above boxes as to sales or advertising, or both, to show that the mark is in current use.

6.5 *Declarations Under Articles 21(2) and 22(2)*

(a) Any declaration under Article 21(2), where included in the international application, shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the statement that the applicant owns a national registration or national registrations of the same mark in the said State or States,
(iii) indicate, in respect of each such national registration, its number.

(b) Any declaration under Article 22(2), where included in the international application, shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the statement that the applicant owns a Madrid registration of the same mark in respect of the said State or States,
(iii) indicate the relevant registration number under the Madrid Agreement.

6.6 *Option Under Article 11(3)*

The indication referred to in Article 11(3) shall be effected by identifying the appropriate national register or the appropriate part of the national register (for example, "Supplemental Register" or "Part B Register").

6.7 *Trade or Business of the Applicant*

The applicant may indicate in the international application the trade or business in which he is engaged.

6.8 *Translation of the Mark*

If the mark consists of or contains one or more words which can be translated into the language of the international application, that application may contain such translation.

RULE 7

Languages

7.1 *Language of the International Application*

The international application shall be in the English or in the French language.

7.2 *Language of the Request for Recording of Later Designations*

The request for the recording of any later designation shall be in the same language as that in which the international application was filed.

7.3 *Language of Registrations, Recordings, Annotations and Communications*

(a) Registrations, recordings and annotations by the International Bureau shall be in the same language as that in which the international application was filed.

(b) Any notification or other communication addressed by the International Bureau to the applicant or the owner of the international registration and any request, demand, declaration or other communication addressed by the applicant or the owner of the international registration to the International Bureau shall be in the same language as that in which the international application was filed.

(c) Notification by the national Offices to the International Bureau, and letters or other written communications from the national Offices to the International Bureau, shall be in the English or in the French language, it being understood that copies of papers filed by a third party in the case of an opposition proceeding attached to any notice of possible refusal and any copy referred to in Rule 20.3(a)(iii) shall be in the language in which such papers or copy were filed with the national Office.

(d) Letters from the International Bureau to any national Office shall be in English or French according to the wish of the national Office; any matter in such letters quoted from the International Register of Marks shall be in the language in which such matter appears in that Register.

(e) Where the International Bureau is under the obligation to forward to the applicant or the owner of the international registration any of the communications referred to in paragraph (c), it shall forward them in the language in which it received them.

RULE 8

Form of the International Application

8.1 *Printed Forms*

(a) The international application shall be made on the printed form referred to in paragraph (b) or on a paper identical, for all practical purposes, with that form as to size, content and layout.

(b) The International Bureau shall furnish free of charge, on request, to prospective applicants, attorneys, patent or trademark agents, and to the national Offices, printed forms for international applications. Such forms shall be established in the English language, in the French language, and in both of those languages.

(c) The form shall be filled in preferably by typewriter and shall be easily legible.

8.2 *Copies; Signature*

(a) Subject to Rule 5.3(c)(ii), the international application, including the reproduction of the mark and any attachments, shall be filed in one copy.

(b) The international application shall be signed by the applicant.

8.3 *No Additional Matter*

(a) The international application shall not contain any matter, and shall not be accompanied by any document, other than those prescribed or permitted by the Treaty or these Regulations.

(b) If the international application contains matter other than that prescribed or permitted, the International Bureau shall delete it ex officio; and if the international application is accompanied by any document other than those prescribed or permitted, the International Bureau shall treat such document as if it had not been transmitted to it and shall return the said document to the applicant.

RULE 9

Fees Payable With the Filing of the International Application

9.1 *International Application Fee and State Designation Fees*

(a) The fees payable with the international application shall be:

(i) an "international application fee," and, where Rule 5.3(c)(i) applies, a color reproduction fee,
(ii) in respect of each designated State, the individual State designation fee or the standard State designation fee, as the case may be.

(b) The amounts of the international application fee, the color reproduction fee and the standard State designation fee are indicated in the Table of Fees.

(c) The amounts of the individual State designation fees concerning the various Contracting States shall be published by the International Bureau each year in the month of August. The amounts so published shall be applicable as the individual State designation fees from January 1 to December 31 of the year following the year in which they are published.

RULE 10

Mandatory Contents of the Request for the Recording of Later Designations

10.1 *Indication that the Request is for the Recording of Later Designations*

The indication referred to in Article 6(2)(a)(i) shall be worded as follows: "The undersigned applicant/owner of the international registration identified herein requests the recording in the International Register of Marks of the following later designations made under the Trademark Registration Treaty"; or it shall consist of a statement to the same effect.

10.2 *Indications Concerning the Applicant or the Owner of the International Registration*

Rule 5.2 shall apply, *mutatis mutandis*, in the case of Article 6(2)(a)(ii).

10.3 *Identification of the International Application or International Registration*

(a) The international application shall be identified by a copy of the same and, where it was filed direct with the International Bureau, the date on which it was filed with or mailed to the International Bureau or, where it was filed through the intermediary of a national Office, the name of that Office and the date on which it was received by or mailed to the said Office.

(b) The international registration shall be identified by its international registration number and date.

10.4 *Identification of the Later Designated States*

Rule 5.5 shall apply, *mutatis mutandis*, in the case of Article 6(2)(a)(iv).

10.5 *Indication of the Choice Between National Mark and Regional Mark*

The choice referred to in Article 6(2)(a)(v) shall be indicated by the words "national mark desired" or "regional mark desired," respectively, or by other words to that effect, appearing next to the name of the designated State to which the choice applies.

10.6 *Collective Marks and Certification Marks*

The indication referred to in Article 6(2)(a)(vi) shall consist of the words "collective mark desired" or "certification mark desired," respectively, or other words to that effect, appearing next to the name of the designated State to which the indication applies.

10.7 *Requests Filed Through the Intermediary of a National Office*

(a) The indication referred to in Article 6(3)(b) shall be worded as follows: "The . . . ① certifies that the present request was filled with it on . . . ②". ① Indicate the name of the national Office. ② Indicate the date.

(b) The national Office of any Contracting State whose national law provides that requests for the recording of later designations by residents of that State may be filed through the intermediary of the national Office of the said State shall, at least once a week, send to the International Bureau a note containing the following indications concerning each of the requests filed with it since the sending of the last such note:

(i) the name of the applicant or the owner of the international registration,
(ii) the international registration number and date to which the request refers or, where such number and date are not available, the reproduction of the mark, together with, where the international application was filed through the intermediary of the national Office, the date on which it was so received by such Office and the date on which it was mailed to the International Bureau or, where the international application was filed direct with the International Bureau, the date on which it was so filed or the date on which it was mailed to the International Bureau,
(iii) the date on which the request was filed with that Office,
(iv) the date on which the request was mailed to the International Bureau.

(c) The notes referred to in paragraph (b) shall be numbered consecutively. Where since the sending of the last note no requests have been filed with the national Office, the note shall state that fact.

(d) If the International Bureau does not receive any of the requests listed in any note within 15 days from the date on which it received such note, it shall inform the national Office accordingly.

RULE 11

Optional Contents of the Request for the Recording of Later Designations

11.1 *Claiming of Priority*

Rule 6.2 shall apply also to the declaration referred to in Article 6(2)(b).

11.2 *Declaration of Intent To Use*

(a) Any declaration made under Article 19(4)(a) shall consist of the following statement:

"The undersigned applicant/owner of the international registration declares that he (it) intends to

use the mark which is the subject of the international application/international registration to which this request relates himself (itself) and/or by and through persons whose use inures to his (its) benefit in commerce with and/or on the territory of . . . ① on and/or in connection with the goods and/or services listed in this request."

① If the declaration relates to all the States designated in the request, insert "each of the States designated in this request"; otherwise, indicate those of the States designated in the request in respect of which the declaration is made.

(b) It shall depend on the national law of each designated State whether any declaration to the same effect as but worded differently than in paragraph (a) shall produce the effect provided for in Article 19(4)(a) in that State.

11.3 *Declaration of Actual Use*

In respect of any State designated in the request for recording of later designations, a statement, signed by the applicant or the owner of the international registration and whose form shall be the same as that appearing in Rule 6.4 or Rule 26.3, as the case may be, may be made and attached to the request.

11.4 *Declarations Under Articles 21(2) and 22(2)*

Rule 6.5 shall apply, *mutatis mutandis*, to any declaration under Articles 21(2) or 22(2), where such declaration is included in the request for the recording of later designations.

11.5 *List of Goods and/or Services*

The formal concept of limitation referred to in Article 6(2)(b), second sentence, is defined in Rule 24.2.

11.6 *Option Under Article 11(3)*

The indication referred to in Article 11(3) shall be effected by identifying the appropriate national register or the appropriate part of the national register (for example, "Supplemental Register" or "Part B Register").

RULE 12

Form of the Request for the Recording of Later Designations

12.1 *Printed Forms*

(a) The request for the recording of later designations shall be made on the printed form referred to in paragraph (b) or on a paper identical, for all practical purposes, with that form as to size, content and layout.

(b) The International Bureau shall furnish free of charge, on request, to applicants, owners of international registrations, attorneys, patent or trademark agents, and to the national Offices, printed forms for requests for the recording of later designations. Such forms shall be established in the English language, in the French language, and in both of those languages.

(c) The form shall be filled in preferably by typewriter and shall be easily legible.

12.2 *Copies; Signature*

(a) The request for the recording of later designations and any attachments thereto shall be filed in one copy.

(b) The request shall be signed by the applicant or the owner of the international registration.

12.3 *No Additional Matter*

Rule 8.3 shall also apply to requests for the recording of later designations.

RULE 13

Fees Payable With the Request for the Recording of Later Designations

13.1 *International Later Designation Fee and State Designation Fees*

(a) The fees payable with the request for the recording of the later designation of any Contracting State shall be the following:

(i) an "international later designation fee," and, where Rule 5.3(c)(i) applies, a color reproduction fee,

(ii) in respect of each later designated State indicated in the request, the individual State designation fee or the standard State designation fee, as the case may be.

(b) The amounts of the international later designation fee, the standard State designation fee and the color reproduction fee are indicated in the Table of Fees.

RULE 14

Defects in the International Application

14.1 *Minimum Amount Under Article 7*

The minimum amount referred to in Article 7(2)(a)(ix) and (3)(a)(i) shall be an amount equivalent to the amount of the international application fee referred to in Rule 9.1(a)(i).

14.2 *Notification, and Reimbursement of Certain Fees, Under Article 7(5)*

(a) Where the International Bureau declines the international application, it shall notify the applicant accordingly and shall state the grounds for declining. It shall reimburse to the applicant all fees received from him except an amount equivalent to the international application fee referred to in Rule 9.1(a)(i).

(b) Where the International Bureau declines to record a State as a designated State either on the ground referred to in Article 7(3)(b) or on the ground that the said State is not a Contracting State, it shall reimburse to the applicant any fee received from him in respect of the attempted designation of that State.

14.3 *Notification of the National Office*

Where the international application is treated as provided for in Article 7(6), the International Bureau shall inform accordingly the national Office through the intermediary of which the application was filed.

RULE 15

Defects in the Request for the Recording of Later Designations

15.1 *Application of Rule 14*

Rule 14 shall apply, *mutatis mutandis*, in respect of Article 8, provided that the amount referred to in Rules 14.1 and 14.2(a) shall be an amount equivalent to the amount of the international later designation fee referred to in Rule 13.1(a)(i).

RULE 16

Procedure Where Avoiding the Effects of Declining Is Sought

16.1 *Recording and Publication Under Article 9(3)*

(a) The fact of having received a copy of a petition under Article 9(1)(i) shall, where the petition relates to

a mark which is already registered in the International Register of Marks, be recorded by recording the subject of the petition, the name of the national Office to which it appears to be addressed, and the date on which the said copy was received.

(b) The publication under Article 9(3) shall contain the international registration number of the mark, the name of the State to whose national Office the petition appears to have been addressed, and the date on which the copy of the petition was received by the International Bureau.

16.2 *Information Available to National Offices*

On the request of the applicant or the owner of the international registration, or of the interested national Office, the International Bureau shall send to that Office a copy of the file of the declined international application or declined request for the recording of later designations, together with a memorandum setting out the grounds for and the various steps leading to the declining of the said application or request.

16.3 *Information Furnished by the National Office*

Any request by a national Office referred to in Article 9(2)(i) shall indicate the grounds on which it is based.

RULE 17

Certificates

17.1 *Certificates of International Registration and Certificates of Recording of Later Designations*

(a) The certificates referred to in Articles 7(1) and 8(1) shall be issued in the name of the International Bureau and shall be signed by the Director General or an officer of the International Bureau authorized to do so by the Director General.

(b) Any such certificate shall consist of a facsimile of the publication of the international registration or of the publication of the recording of the later designations, as the case may be, and a statement to the effect that the said registration or recording reproduced in the certificate has been effected in the International Register of Marks.

(c) The certificate shall be promptly sent to the owner of the international registration.

RULE 18

Publication of International Registrations and Recordings of Later Designations

18.1 *Contents of Publication of International Registrations*

(a) The publication of any international registration shall contain:

(i) the name and address of the owner of the international registration, together with any indication of his trade or business and, if he bases his right to file international applications on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be.

(ii) the reproduction of the mark, together with any indication under Rule 5.3(d) or (e) and any transliteration and translation; where color is claimed, the reproduction shall be in color if Rule 5.3(c)(i) applies, and it shall be in black and white and shall be accompanied by a description of the colors in words and signs if Rule 5.3(c)(ii) applies,

(iii) the list of goods and/or services,

(iv) the names of the designated States and, where applicable, after the name of each such State, an indication concerning the choice referred to in Rule 5.6 and the indication referred to in Rule 5.7,

(v) the international registration date,

(vi) the international registration number,

(vii) where the priority of one or more earlier applications is claimed, the date of filing and the number (if available) of such applications, the name of the country or countries in which or for which they were filed, and, where applicable, an indication that the application was filed under this Treaty or, where it was for a regional mark, an indication of the authority with which it was filed,

(viii) any indication under Article 11(3),

(ix) any declaration under Articles 21(2) and 22(2),

(x) the particulars concerning the representative, as provided in Rule 39.2(a).

(b) Where, in respect of any designated State, the international registration is effected pursuant to Article 9(2)(i), this fact shall be indicated in the publication.

(c) The Administrative Instructions shall provide for the composition and allocation of international registration numbers.

18.2 *Contents of Publication of Recordings of Later Designations*

(a) The publication of any recording of a later designation shall contain:

(i) *mutatis mutandis*, the same elements as those referred to in Rule 18.1(a),

(ii) the international later designation number,

(iii) the date of the recording of the later designation.

(b) Where the recording of any later designation is effected pursuant to Article 9(2)(i), this fact shall be indicated in the publication.

(c) The Administrative Instructions shall provide for the composition and allocation of international later designation numbers.

(d) Where the recording of any later designation was effected sufficiently prior to the date of publication of the international registration to be practical to do so, the publication of the recording of the later designation shall be consolidated with the publication of the international registration.

RULE 19

Notification of International Registrations and Recordings of Later Designations

19.1 *Form of Notification*

The notification referred to in Article 10(2) shall be effected separately for each national Office and shall consist of:

(i) a list of the international registration numbers and the international later designation numbers of the international registrations and recordings of later designations in which the State of the said Office has been designated,

(ii) reprints made of the publication by the International Bureau of each international registration and of each recording of later designations referred to in the said list,

(iii) a copy of the international application or the request for the recording of later designations if it contains a declaration made under Article 19(4)(a),

(iv) a copy of any declaration made under Rules 6.4 or 11.3,

(v) where Rule 5.3(c)(ii) applies, the reproduction in color of the mark in the number of copies specified

in the Administrative Instructions, provided that such Instructions shall enable each national Office to require at least six copies.

19.2 *Time of Notification*

The notification shall be effected on the same day as that on which the issue of the Gazette is published that contains the matter from which the reprints referred to in Rule 19.1(ii) are made.

RULE 20

Refusals; Notices of Possible Refusal

20.1 *Notifying the International Bureau; Grounds*

(a) Any notification under Article 12(2)(a) shall be sent in one copy, preferably on a form furnished free of charge by the International Bureau to the national Office of each Contracting State. The notification shall, in any case, contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the refusal or the notice of possible refusal relates,
(ii) the name of the owner of the international registration,
(iii) an indication of the mark in the cases and the manner provided for in paragraph (b),
(iv) an indication as to whether the notification is that of a refusal or of a notice of possible refusal,
(v) where it relates to some only of the goods and/or services listed, identification of those to which it relates,
(vi) the grounds referred to in Article 12(2)(a)(ii) and (iii), together with a reproduction of any mark cited in the notification and not reproduced therein and a copy of the list of goods and/or services (in the original language) pertaining to such mark, and, when the notice of possible refusal specifies the grounds by reference to the opposition of a third party, a copy of any document filed by the opposing party in which the said grounds are specified, together with a reproduction of any mark cited in the said document and not reproduced therein and a copy of the list of goods and/or services pertaining to such mark; where the grounds specified by the national Office in the notice of possible refusal do not include the grounds or some of the grounds invoked in the document filed by the opposing party and transmitted together with the said notice by the national Office, all the grounds contained in the said document shall be considered as having been specified by the national Office,
(vii) an indication as to whether any remedy is available, and if so with which authority it has to be sought and within what time limit.

(b) The cases and the manner referred to in paragraph (a)(iii) and in Rules 21.1(a)(ii) and 28.1(c)(ii) shall be as follows:

(i) where the mark consists of letters of the Latin alphabet, Arabic or Roman numerals, and punctuation signs usual in connection with the Latin alphabet, without any special graphic features and without also containing figurative elements, the indication shall consist of the letters, numerals and signs,
(ii) where item (i), above, does not apply, the indication shall consist of a reproduction of the mark.

(c) The form referred to in paragraph (a) shall be prepared separately for each Contracting State, in collaboration with its national Office. It shall list the more more common of the grounds for refusal with a reference to the pertinent provisions of the national law so that, wherever possible, such grounds may be specified by marking the applicable items of the list. The form shall contain a space reserved for specifying any other grounds and for other possible indications.

20.2 *Notifying the Owner of the International Registration; Publication*

(a) The notification, under Article 31, of the recording effected under Article 12(4)(a) shall be sent to the owner of the international registration promptly after the receipt of the notification referred to in Article 12(2)(a); it shall indicate the date on which the notification made under Article 12(2)(a) was received by the International Bureau and shall include a copy thereof.

(b) The publication of the recording effected under Article 12(4)(a) shall be effected promptly and shall contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the refusal or the notice of possible refusal relates, and the name of the owner of the international registration,
(ii) the name of the State whose national Office transmitted the notification,
(iii) a statement to the effect that a notification under Article 12(2)(a) was received.

20.3 *Notification and Recording of Final Decisions of Refusal; Cancellation of the designation, and Publication of the Cancellation*

(a) The notification by the national Office under Article (12)(4)(b) shall be effected promptly after the date on which the decision of refusal becomes final and shall contain:

(i) an indication that it relates to a final decision of refusal,
(ii) the indications referred to in Rule 20.1(a)(i),
(iii) where the decision is that of a court, a copy of the final decision, or, where the decision is not that of a court, the grounds given in the final decision, preferably in the same manner as that indicated in Rule 20.1(c),
(iv) where the notification relates to some only of the goods and/or services listed, identification of those to which it relates,
(v) the name of the authority which pronounced the decision, the number, if any, and the date of such decision,
(vi) the date on which the decision became final.

(b) The notification by the International Bureau under Article 12(4)(b) shall be effected as soon as possible and shall include a copy of the notification referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision and an indication of the date of the receipt of such notification by the International Bureau.

(c) The details of the recording referred to in Article 12(4)(b) shall be provided in the Administrative Instructions.

(d) The publication referred to in Article 12(4)(b) shall be effected promptly and shall consist of the indications contained in the notification referred to in paragraph (a)(i) and (iv) to (vi), above, as well as the name of the State whose authorities have pronounced the final decision and the name of the owner of the international registration.

20.4 *Notification and Publication Where Final Decision Results in Acceptance of the Effect Provided for in Article 11(2)*

(a) The notification under Article 12(4)(c) shall be effected promptly after the final disposal of the case and shall consist of a statement to the effect that the notice

of possible refusal or the refusal is withdrawn, the indications referred to in Rule 20.1(a)(i), the number, if any, and the date of the decision, and the date on which the decision became final.

(b) The publication referred to in Article 12(4)(c) shall be effected promptly and shall consist of the elements referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision and the name of the owner of the international registration.

20.5 *Belated Notifications*

If any notification referred to in Article 12(2)(a) is received by the International Bureau after the expiration of the time limit fixed in that provision, the International Bureau shall inform accordingly the national Office which effected the notification, treat such notification as if it had not been effected, inform the owner of the international registration that the notification it received is belated, and send to the owner a copy thereof.

RULE 21

Final Decisions of Cancellation

21.1 *Notification and Recording of Final Decisions of Cancellation; Cancellation of the Designation, and Publication of the Cancellation*

(a) The notification referred to in Article 13(3) shall be effected promptly after date on which the decision of cancellation becomes final and shall contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the final decision of cancellation relates,
(ii) an indication of the mark in the cases and the manner provided for in Rule 20.1(b),
(iii) where the final decision relates to some only of the goods and/or services listed, identification of those to which it relates,
(iv) the name of the authority which pronounced the final decision,
(v) the number, if any, and the date of such decision,
(vi) the date on which the decision became final.

(b) The details of the recording referred to in Article 13(3) shall be provided in the Administrative Instructions.

(c) The publication referred to in Article 13(3) shall be effected promptly and shall consist of the indications contained in the notification referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision of cancellation and the name of the owner of the international registration.

RULE 22

Changes in Ownership

22.1 *Request for Recording of Change in Ownership*

(a) The indication referred to in Article 14(1)(b)(i) shall preferably be worded as follows: "The undersigned requests that the following change in ownership concerning the international registration identified herein be recorded."

(b) Rule 5.2 shall apply, *mutatis mutandis*, to the indications concerning the new owner referred to in Article 14(1)(b)(iii).

(c) The designated States referred to in Article 14(1)(b)(iv) shall be identified by their names in a manner sufficiently clear for the purpose, provided that, where the request relates to all the States designated in the existing international registration, they may be identified by a statement to that effect.

(d) The goods and/or services referred to in Article 14(1)(b)(iv) shall be identified as follows:

(i) where the request relates to all of the designated States and all of the goods and/or services listed in respect of each of those States, by a statement to that effect,
(ii) where the request relates to all of the designated States and the list of goods and/or services, while being the same for each, is more limited than in the international registration, by a new list and by a statement to the effect that it applies to all of the designated States,
(iii) in all other cases, in respect of those States for which the list of goods and/or services is the same as in the existing international registration, by a statement to that effect, and, in respect of those States for which the list of goods and/or services is more limited than the list of goods and/or services in the existing international registration, by a new list.

(e) The attestation referred to in Article 14(1)(c) shall be worded as follows:

> "According to evidence produced before this Office, . . . ① appears to be the successor in title of . . . ② to the extent described in the present request, and the conditions referred to in Article 14(1)(c) of the Trademark Registration Treaty appear to be fulfilled. This attestation is given for the sole purpose of allowing the change of ownership to be recorded in the International Register of Marks."
>
> ① Insert the name of the new owner. ② Insert the name of the earlier owner.

(f) The attestation shall be dated and shall bear the stamp or seal of the national Office and the signature of an official thereof.

(g) the amount of the fee referred to in Article 14(1)(d) is indicated in the Table of Fees.

(h) The request may contain an indication of the trade or business in which the new owner is engaged.

22.2 *Publication Where the Change in Ownership is Total*

(a) Where the change in ownership concerns all the designated States and all the goods and/or services, the publication referred to in Article 14(1)(d) shall contain:

(i) an indication that the change in ownership concerns all the designated States and all the goods and/or services,
(ii) the name and address of the new owner together with the indication, if any was given by him, of his trade or business and, if he bases his right to own international registrations on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(iii) the name of the earlier owner,
(iv) the date on which the International Bureau received the request,
(v) a reference to all the prior publications concerning the international registration except those which have been superseded by later publications in respect of that registration.

(b) The publication shall be effected under the number of the international registration, and, where applicable, the numbers of later designations to which it refers, followed by such further indications as the Administrative Instructions shall provide.

22.3 *Publication Where the Change in Ownership Is Partial*

(a) Where the change in ownership concerns fewer than all of the designated States and/or some only of the

goods and/or services, the publication referred to in Article 14(1)(d) shall contain two parts, one concerning the new owner, the other the earlier owner.

(b) The part concerning the new owner shall contain:

(i) an indication that the publication is effected pursuant to a request for the recording of a change in ownership,
(ii) the date on which the International Bureau received the request,
(iii) the number under which the part concerning the earlier owner is published,
(iv) the name and address of the new owner together with the indication, if any was given by him, of his trade or business and, if he bases his right to own international registrations on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(v) all the indications which, prior to the date referred to in item (ii), were published in respect of the international registration and which have not been superseded by later publications in respect of that registration, except those indications which solely concern designated States and goods and/or services in respect of which ownership is retained by the earlier owner.

(c) The part concerning the earlier owner shall contain:

(i) an indication that the publication concerns an existing international registration and contains those elements of that registration which, after the recording of the change in ownership concerning that registration, continue to concern the earlier owner,
(ii) the number under which the part concerning the new owner is published,
(iii) the date on which the International Bureau received the request,
(iv) all the indications which, prior to the date referred to in item (iii), were published in respect of the international registration and have not been superseded by later publications in respect of that registration, except those indications which, because of the change in ownership, no longer concern the earlier owner.

(d) Each part shall have a number and possibly also an appropriately worded heading. The Administrative Instructions shall provide the details of such numbers and headings.

22.4 *Notification of Recording of Changes*

(a) The notifications referred to in Article 14(1)(d) shall be effected by sending reprints of the publication referred to in Rules 22.2 and 22.3.

(b) The transmittal to designated Offices of the reprints referred to in paragraph (a) shall be accompanied by a list of the numbers referred to in Rules 22.2(b) and 22.3(d) relating to recordings concerning the designated State to which the list is addressed. Rule 19.2 shall apply, *mutatis mutandis*.

22.5 *Notification of Declining of the Recording*

The notification referred to in Article 14(2)(a) shall be effected by letter. The letter shall state the grounds for declining.

22.6 *Denial*

(a) The notification by the national Office referred to in Article 14(4)(c) shall:

(i) refer to the fact of the denial,
(ii) identify the authority that pronounced the denial and the date on which it was pronounced,
(iii) indicate the relevant number or numbers referred to in Rule 22.2(b) and 22.3(d),
(iv) contain a brief indication of the grounds for the denial.

(b) The recording and the publication referred to in Article 14(4)(c) shall contain:

(i) the elements referred to in paragraph (a),
(ii) the date on which the International Bureau received the notification referred to in paragraph (a),
(iii) a reference to the publication of the recording effected under Article 14 (1)(d).

(c) The notification by the International Bureau referred to in Article 14(4)(c) shall be sent to the earlier and the new owners and to the national Office which notified the denial.

RULE 23

Changes in the Name of the Owner of the International Registration

23.1 *Request for Recording of Change in the Name*

(a) The indication and declaration referred to in Article 15(2)(b)(i) and (ii) shall preferably be worded as follows: "The undersigned requests that the following change in the name of the owner of the international registration(s) identified herein be recorded. He declares that this change in his name does not amount to change in ownership."

(b) Rules 5.2(a) shall apply, *mutatis mutandis*, to the indication of both the former and the new names of the owner of the international registration.

(c) The amount of the fee referred to in Article 15(2)(d) is indicated in the Table of Fees.

23.2 *Publication*

(a) The publication referred to in Article 15(3) shall contain:

(i) an indication to the effect that it concerns a change in the name of the owner of the international registration,
(ii) the former name of the owner,
(iii) the new name of the owner,
(iv) the international registration number of the international registration in respect of which the recording has been effected,
(v) the date on which the International Bureau received the request,
(vi) a reference to all the prior publications concerning the international registration except those which have been superseded by later publication in respect of the international registration concerned.

(b) The publication shall be effected under the number of the international registration, and, where applicable, the numbers of later designations to which it refers, followed by such further indications as the Administrative Instructions shall provide.

23.3 *Notification of Recording*

(a) The notifications referred to in Article 15(3) shall be effected by sending reprints of the publication referred to in Rule 23.2.

(b) The transmittal to designated Offices of the reprints referred to in paragraph (a) shall be accompanied by a list of the numbers referred to in Rule 23.2(b) relating to recordings concerning the designated State to whose national Office the list is addressed. Rule 19.2 shall apply, *mutatis mutandis*.

23.4 *Notification of Declining the Recording*

The notification referred to in Article 15(4) shall be effected by letter. The letter shall state the grounds for declining.

23.5 *Denial*

(a) The notification by the national Office referred to in Article 15(6)(b) shall:

(i) refer to the fact of the denial,
(ii) identify the authority which pronounced the denial and the date on which it was pronounced,
(iii) indicate the relevant number or numbers referred to in Rule 23.2(b),
(iv) contain a brief indication of the grounds for the denial.

(b) The recording and the publication referred to in Article 15(6)(b) shall contain:

(i) the elements referred to in paragraph (a),
(ii) the date on which the International Bureau received the notification referred to in paragraph (a),
(iii) a reference to the publication of the recording effected under Article 15(3).

(c) The notification by the International Bureau referred to in Article 15(6)(b) shall be sent to the owner of the international registration and to the national Office which notified the denial.

RULE 24

Recording of Limitations of the List of Goods and/or Services

24.1 *Request for Recording of Limitation of the List*

(a) The request for recording referred to in Article 16(1) shall indicate its purpose and contain:

(i) the name of the owner of the international registration,
(ii) the international registration number,
(iii) the desired limitation of the list of goods and/or services,
(iv) where the request relates to fewer than all the designated States, identification of those States to which it relates,
(v) where the request relates to one only of the designated States and, while not conforming with the formal concept of limitation as defined in Rule 24.2(a) and (b), it conforms with a decision of the national Office or other competent authority of such State concerning the international registration, a copy of such decision and, if the decision is in a language other than English or French, a translation of such decision.

(b) The request shall be signed by the owner of the international registration.

(c) The amount of the fee referred to in Article 16(2) is indicated in the Table of Fees.

(d) Where any term which is the subject of the request appears under more than one class of the International Classification and the request does not identify the class or classes to which it relates, such request shall be treated as if it related to the term under each of the classes under which it appears.

24.2 *Formal Concept of Limitation*

(a) Subject to paragraph (c), any request under Article 16(1) shall be regarded as conforming with the formal concept of limitation if it is presented in any of the following forms:

(i) it asks for the deletion of one or more terms in the list of goods and/or services,
(ii) it asks for the insertion of one or more words, linked to the existing term by words (such as "except") which, from the point of view of syntax, make it clear that the inserted word or words are meant to be excluded from the existing term (for example, *milk products* (existing term) *except* (linking word) *condensed milk* (inserted words)),
(iii) it asks for the insertion of one or more words linked to the existing term by words (such as "provided that") which, from the point of view of syntax, make it clear that the inserted words are covered by the existing term (for example, *pineapples* (inserted word) *provided that they are* (linking words) *canned fruits* (existing term)).

(b) Unless the limitation is presented in one of the forms described in paragraph (a), it shall not, subject to paragraph (c), be regarded as conforming with the formal concept of limitation, however clear it may be that, in the ordinary sense of the word, there is a limitation (for example, replacing the term "milk products" by "condensed milk").

(c) For the purposes of Rule 24.1(a)(v), any change in the list of goods and/or services decided upon by the national Office or other competent authority concerned shall be deemed to conform with the formal concept of limitation.

24.3 *Recording, Publication, and Notification, of Limitation of the List*

(a) If the request complies with the prescribed requirements, the International Bureau shall record the indications referred to in Rule 24.1(a)(i) to (iv) and the date on which the request was received.

(b) Where the request is based on a decision referred to in Rule 24.1(a)(v), this fact, together with the following particulars, shall also be recorded:

(i) the name of the authority which pronounced the decision,
(ii) the number, if any, and the date of such decision.

(c) The publication and the notification referred to in Article 16(2) shall contain the indications referred to in Rule 24.1(a)(i) to (iv), the indications referred to in paragraph (b) and the date of the recording.

24.4 *Declining the Recording of Limitation of the List*

If the request does not comply with the prescribed requirements, the International Bureau shall decline the recording of the limitation and shall notify the owner of the international registration accordingly. The notification shall include the grounds for declining.

24.5 *Invitation to Record Limitation of the List; Recording, Publication and Notification*

(a) The invitation by the national Office referred to in Article 16(5)(a) or (b) shall:

(i) indicate the relevant international registration number and date,
(ii) indicate the name of the owner of the international registration,
(iii) refer to the declining of the request of the owner or to the recording of the limitation by the International Bureau, as the case may be,
(iv) indicate the finding of the national Office or other competent authority together with a brief indication of its grounds,
(v) where the finding is contained in a decision, identify the authority which pronounced the decision and the date on which it was pronounced,
(vi) where, under Article 16(5)(b), the limitation is found to be a limitation only in part, specify the extent to which it is found to be a limitation.

(b) The recording and the publication referred to in Article 16(5)(c) shall contain:

(i) the elements referred to in paragraph (a),
(ii) the date on which the International Bureau received the invitation referred to in paragraph (a),
(iii) a reference to the publication of the recording, if any, effected under Article 16(1).

(c) The notifications by the International Bureau referred to in Article 16(5)(c) shall be sent to the national Office which sent the invitation.

RULE 25

Renewal

25.1 *Reminder by the International Bureau*

The International Bureau shall send a letter to the owner of the international registration before the expiration of the term, initial or renewal (as the case may be), which is in effect, reminding him that such term is about to expire. Further details concerning the contents of the reminder shall be provided in the Administrative Instructions. The reminder shall be sent at least 6 months before the expiration date. Failure to send or receive the reminder, or the fact of sending or receiving it outside the said period, or any error in the reminder, shall not affect the expiration date.

25.2 *Demand for Renewal*

(a) Any demand for renewal may exclude any of the designated States.

(b) Any demand for renewal may exclude in respect of any of the designated States all the goods and/or services appearing in the international registration under a given class or under given classes of the International Classification.

(c) The demand for renewal referred to in Article 17(3)(a) shall preferably be made on a printed form furnished free of charge by the International Bureau together with the reminder referred to in Rule 25.1. The demand shall, in any case, indicate its purpose and contain:

(i) the name and address of the owner of the international registration,
(ii) the international registration number,
(iii) where the demand contains any exclusion under paragraphs (a) or (b), the identification of the state or States and/or the class or classes referred to in paragraph (b).

(d) Where the demand contains any exclusion under paragraphs (a) or (b), it shall be signed by the owner of the international registration.

(e) The demand for renewal shall not be combined with any other request; in particular, it shall not contain a request for recording a later designation, a request for recording a change in ownership, or, subject to paragraph (b), a request for recording a limitation in the list of goods and/or services.

(f) Rule 8.3 shall also apply to demands for renewal, provided that any declaration under Article 19(3)(d) may be filed at the same time as the demand for renewal.

25.3 *International Renewal Fee and State Renewal Fees*

(a) The fees payable under Article 17(3)(a) shall be the following:

(i) an "international renewal fee," and, where Rule 5.3(c)(i) applies, a color reproduction fee, as well as, where applicable, the "renewal surcharge" referred to in Article 17(3)(a),
(ii) in respect of each designated State to which the demand relates the individual State renewal fee or the standard State renewal fee, as the case may be.

(b) The amounts of the international renewal fee, the color reproduction fee, the renewal surcharge and the standard State renewal fee are indicated in the Table of Fees.

(c) The amounts of the individual State renewal fees concerning the various Contracting States shall be published by the International Bureau each year in the month of August. The amounts so published shall be applicable as the individual State renewal fees from January 1 to December 31 of the year following the year in which they are published.

25.4 *Imperfect Demands*

(a) Where, within the time limits fixed in Article 17(3)(a), the International Bureau receives:

(i) a demand which does not conform with the requirements of Rule 25.2, or
(ii) a demand but no payment or insufficient payment to cover the renewal fees and any surcharge that is due, or
(iii) money which appears to be intended to cover fees connected with renewal but no demand,

it shall, whenever practicable, promptly invite the owner of the international registration to present a correct demand, to pay or complete the renewal fees and any surcharge that is due, or to present a demand, as the case may be. The invitation shall indicate the applicable time limits.

(b) Failure to send or receive the invitation referred to in paragraph (a), or any delay in dispatching or receiving such invitation, or any error in the invitation, shall not prolong the time limits fixed in Article 17(3)(a).

25.5 *Recording, Publication, and Notification*

(a) Where the demand is presented and the fees are paid as prescribed, the International Bureau shall record the renewal and shall publish the elements, as specified in paragraph (b), of the international registration as it stands on the first day of the term of renewal, together with an indication both of the fact that the publication is that of a renewal and of the date on which the renewal shall expire.

(b) The elements referred to in paragraph (a) shall be the following:

(i) the name and address of the owner of the international registration, together with the indication, if any was given by him, of his trade or business and, if he bases his right to own international registrations on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(ii) the reproduction of the mark, together with any indication under Rule 5.3(d) or (e) and any transliteration and translation; where color is claimed, the reproduction shall be in color if Rule 5.3(c)(i) applies, and it shall be in black and white and shall be accompanied by a description of the colors in words and signs if Rule 5.3(c)(ii) applies,
(iii) the list of goods and/or services, provided that, where the list of goods and/or services differs in respect of different designated States, the publication shall contain appropriate indications in order to show which goods and/or services relate to which designated State,
(iv) the names of the designated States and, where applicable, after the name of each such State, an indication concerning the choice referred to in Rule 5.6 and the indication referred to in Rule 5.7,

(v) where, in respect of any designated State, a refusal or notice of possible refusal was notified and no final decision resulting in the cancellation of the designation or in the acceptance of the effect referred to in Article 11(2) has been notified, an indication that a refusal or notice of possible refusal was notified, together with the date of the receipt by the International Bureau of the notification of the refusal or notice of possible refusal,
(vi) the international registration number,
(vii) any international later designation number,
(viii) where the priority of one or more earlier applications was claimed, a statement that such claim has been made,
(ix) a reference to any indication under Article 11(3),
(x) a reference to any declaration under Articles 21(2) and 22(2),
(xi) particulars concerning the representative, as provided in Rule 39.2(a).

(c) Any indication which, at some time prior to the first day of the term of renewal, has been part of the international registration but which, before that day, has been cancelled or superseded shall not be included in the publication referred to in paragraph (a).

(d) The notification under Article 31 shall be effected by sending to the owner of the international registration a reprint of the publication of the renewal referred to in paragraph (a).

(e) The International Bureau shall notify each designated Office of the renewal by sending it:

(i) a reprint of the publication referred to in paragraph (a), and
(ii) where Rule 5.3(c)(ii) applies, the reproduction of the mark in the number of copies specified in the Administrative Instructions, provided that such Instructions shall enable each national Office to require at least six copies.

25.6 *Declining the Demand*

(a) Where the time limits fixed in Article 17(3)(a) are not respected or where the demand does not conform with the requirements of Rule 25.2 or the fees (including, where applicable, any surcharge) are not paid as prescribed, the International Bureau shall decline the demand and shall notify the owner of the international registration by letter. The letter shall state the grounds for declining.

(b) The International Bureau shall not decline any demand before the expiration of 6 months after the starting date of the term of renewal.

25.7 *Reimbursement of Certain Fees*

Where, under Rule 25.6(a), the International Bureau declines the demand, it shall reimburse to the owner of the international registration all fees received from him except an amount equivalent to the international renewal fee referred to in Rule 25.3(a)(i).

25.8 *Recording of Lack of Demand*

Where, by the expiration of 6 months after the starting date of the term of renewal, no demand for renewal is presented to the International Bureau in respect of any or all of the designated States, such fact shall be recorded by the International Bureau.

25.9. *Publication of Lists of International Registrations Not Renewed*

The International Bureau shall publish, at intervals specified in the Administrative Instructions, a list of the international registration numbers of those international registrations which, having become due for renewal, have been renewed in respect of none of the designated States.

RULE 26

Declarations of Actual Use

26.1 *Information on Requirements Concerning Routine Declarations of Actual Use*

The national Office of any Contracting State whose national law requires the filing of routine declarations referred to in the first sentence of Article 19(3)(d) shall inform the International Bureau of such requirement and of any changes therein. Such information shall, in particular, indicate the time limits within which such declarations must be filed according to the national law and state whether the attachment of specimens or facsimiles to routine declarations of actual use is required by the national law. Any information received shall be published promptly upon receipt. Furthermore, the International Bureau shall republish in August of each year all the information received and still applicable at the time of the republication in respect of all the States concerned.

26.2 *National Forms*

The national Office of any Contracting State referred to in Rule 26.1 shall supply free of charge to the International Bureau in reasonable quantities declaration forms, in the form prescribed by the national law of that State, for the purposes of making declarations referred to in Article 19(3)(d). The International Bureau shall furnish such forms free of charge to interested persons.

26.3 *International Form*

(a) Where the declaration referred to in Article 19(3)(d) is not made on a national form according to Rule 26.2, it shall be made on a form ("international form") consisting of the following statement and shall be signed by the owner of the international registration:

> "The undersigned owner of the international registration declares that he (it) is the owner of the international registration which was effected under No. . . . , as shown by recordings in the International Register of Marks, in respect of . . . ① on . . . ②; that the mark which is the subject of the international registration herein identified is now in use by and through . . . ③ in commerce with and/or on the territory of the said State on or in connection with the following goods and/or services listed in respect of such State: . . . ④; that such use commenced on . . . ⑤; and that the mode or manner in which the mark is used is:
>
> ☐ on labels or tags affixed to and/or containers for the goods, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
> ☐ on displays which are associated with the goods, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
> ☐ in the case of services in advertising of such services, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
> ☐ other ⑦."

① Insert name of State. ② Insert international registration date or, if applicable, recording date of the later designation of such State. ③ Insert "the undersigned owner" and/or, if applicable, the name and address of the person or persons whose use of the mark inures to the benefit of the owner in the State. ④ Insert "all" or indicate the particular goods and/or services on or in connection with which the mark is used. ⑤ Insert the date of commencement of the continuing use of the mark, including, where different dates are applicable to different goods and/or services, the particular goods and/or services to which each such date relates. ⑥ The inclusion of specimens or

facsimiles may be dispensed with where the declaration is made in respect of a State whose national law does not require that specimens or fascimiles be attached to routine declarations of actual use. ⑦ Recite sufficient facts in addition to, or in lieu of, checking one or more of the above boxes as to sales or advertising, or both, to show that the mark is in current use.

(b) The International Bureau shall furnish such forms free of charge to interested persons.

(c) The inclusion of specimens or facsimiles may be dispensed with where the declaration is made in respect of a State whose national law does not require that specimens or facsimiles be attached to routine declarations of actual use.

(d) The specimens referred to in paragraph (a) shall, in the case of a mark for goods, be duplicates of the actually used labels, tags, or containers, or of the displays associated therewith, or portions thereof, when made of suitable material and capable of being arranged flat and of a size not larger than the declaration. When, owing to the mode of applying or affixing the mark to the goods or to the manner of its use on the goods, such specimens cannot be furnished, suitable photographs or other acceptable reproductions, not larger than the declaration, which clearly and legibly show the mark and all matter used in connection therewith, shall be furnished. In the case of marks for services, specimens or facsimiles, as specified above, of the mark as used in the sale or advertising of the services shall be furnished unless impossible because of the nature of the mark or the manner in which it is used, in which event some other acceptable reproductions shall be furnished.

(e) It shall depend on the national law of each Contracting State whether any declaration to the same effect as but worded differently than in paragraph (a) shall produce the same effect.

RULE 27

Declarations Concerning Earlier National or Madrid Registrations

27.1 *Separately Filed Declarations*

(a) Any separately filed declaration under Article 21(2) shall:

(i) specify the designated State or States in respect of which it is made,

(ii) contain the statement that the owner of the international registration owned a national registration or national registrations in the said State or States on the international registration date or the international later designation date, as the case may be,

(iii) indicate, in respect of each such national registration, its number,

(iv) indicate the international registration number of the international registration to which it relates.

(b) Any separately filed declaration under Article 22(2) shall:

(i) specify the designated State or States in respect of which it is made,

(ii) contain the statement that the owner of the international registration owned a registration under the Madrid Agreement in respect of the said State or States on the international registration date or the international later designation date, as the case may be,

(iii) indicate the number of the relevant Madrid registration,

(iv) indicate the international registration number of the international registration to which it relates.

27.2 *Certification of National Registrations*

The certification of the copy of any national registration referred to in Article 21(2) shall be in the English or French language, shall be signed by a person authorized by the national Office to effect certifications and shall indicate the date to which the certification refers. That date shall be the international registration date or the international later designation date, as the case may be, or, where the certification is made before international registration or recording of the later designation is effected, the date on which the certification is effected. In the latter case, the national Office effecting the certification shall, on the request of the International Bureau presented once the said registration or recording is effected by it, indicate to that Bureau any change which might have occurred in respect of the national registration between the date to which the certification referred and the international registration date or the recording date of the later designation, as the case may be.

27.3 *Defects*

(a) The International Bureau shall promptly notify the applicant or the owner of the international registration of any defect in the declaration made under Article 21(2) or Article 22(2), including the absence of the certified copy referred to in Article 21(2) and any defect in the certification thereof as provided in Rule 27.2.

(b) As long as any defect referred to in paragraph (a) is not corrected, the International Bureau shall treat the declaration as if it had not been made.

27.4 *Publication; Notification*

(a) Unless effected by virtue of Rule 18.1(a)(ix) or Rule 18.2(a)(i), the publication of any declaration under Article 21(2) or Article 22(2) shall indicate:

(i) the fact that the publication relates to a declaration made under Article 21(2) or 22(2), as the case may be,

(ii) the State or States in respect of which the declaration was made and the numbers of the relevant national or Madrid registrations,

(iii) the international registration number of the international registration to which the declaration relates,

(iv) the name of the owner of the international registration.

(b) Unless effected by virtue of Rule 19.1, the notification of any declaration under Article 21(2) or 22(2) shall consist of an indication that the declaration made under Article 21(2) or 22(2), as the case may be, was recorded by the International Bureau and shall be accompanied by a copy of the declaration.

RULE 28

Transmittal of Documents to the International Bureau

28.1 *Place and Mode of Transmittal*

(a) International applications, requests, demands, notifications and any other documents intended for filing, notification or other communication to the International Bureau shall be deposited with the competent service of that Bureau during the office hours fixed in the Administrative Instructions, or mailed to that Bureau.

(b) Where any document is transmitted to the International Bureau in response to an invitation by that Bureau bearing a reference number, the document shall indicate such reference number.

(c) Where paragraph (b) does not apply, any document transmitted to the International Bureau shall:

(i) where it relates to an international application, be accompanied by a copy of such application,

(ii) where it relates to an international registration, indicate, by its international registration number, the international registration to which it relates; it may also contain an indication of the mark as provided for in Rule 20.1(b).

(d) Paragraph (c) shall not apply in those cases where these Regulations contain specific provisions on the identification of the international application or registration to which any document transmitted to the International Bureau relates.

28.2 *Date of Receipt of Documents*

Any document received by the International Bureau through deposit or mail shall be considered to have been received on the day on which it is actually received by that Bureau, provided that, when it is actually received after office hours, or on a day when the Bureau is closed for business, it shall be considered to have been received on the next subsequent day on which the Bureau is open for business.

RULE 29

Signature

29.1 *Legal Entity*

(a) Where any document submitted to the International Bureau is signed by a legal entity, the name of the legal entity shall be indicated in the place reserved for signature and shall be accompanied by the signature of the natural person or persons entitled to sign for such legal entity according to the national law of the State under whose law the legal entity was established.

(b) Paragraph (a) shall apply, *mutatis mutandis*, to partnerships or firms composed of attorneys or patent or trademark agents but which are not legal entities.

29.2 *Exemption from Certification*

No signature provided for under the Treaty or these Regulations shall require authentication, legalization or other certification.

RULE 30

Calendar; Computation of Time Limits

30.1 *Calendar*

The International Bureau, national Offices, applicants and owners of international registrations shall, for the purposes of the Treaty and these Regulations, express any date in terms of the Christian era and the Gregorian calendar.

30.2 *Periods Expressed in Years, Months, or Days*

(a) When a period is expressed as one year or a certain number of years, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire in the relevant subsequent year in the month having the same name and on the day having the same number as the month and the day on which the said event occurred, provided that if the relevant subsequent month has no day with the same number the period shall expire on the last day of that month.

(b) When a period is expressed as one month or a certain number of months, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire in the relevant subsequent month on the day which has the same number as the day on which the said event occurred, provided that if the relevant subsequent month has no day with the same number the period shall expire on the last day of that month.

(c) When a period is expressed as a certain number of days, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire on the day on which the last day of the count has been reached.

30.3 *Local Dates*

(a) The date which is taken into consideration as the starting date of the computation of any period shall be the date which prevails in the locality at the time when the relevant event occurred.

(b) The date on which any period expires shall be the date which prevails in the locality in which the required document is filed or the required fee is paid.

30.4 *Expiration on a Non-Working Day*

If the expiration of any period during which any document or fee must reach the International Bureau or any of its agencies falls on a day on which such Bureau or agency is not open for business, or on which ordinary mail is not delivered in Geneva or the locality in which the agency is situated, the period shall expire on the next subsequent day on which neither of the said two circumstances obtains.

RULE 31

Payment of Fees

31.1 *Payment to the International Bureau*

All fees due under the Treaty and these Regulations shall be payable to the International Bureau.

31.2 *Applicable Fee Schedule*

The fees payable shall be:

(i) where they concern an international application or a request for the recording of a later designation, the fees in force on the date the international application or the request for the recording of the later designation is received by the International Bureau or, where the application or request has been filed through the intermediary of a national Office under Article 5(3), on the date on which it was received by that Office,

(ii) where they concern a demand for renewal, the fees in force on the date which precedes by 6 months the starting date of the term of renewal.

31.3 *Currency*

(a) Subject to paragraph (b), all fees due under the Treaty and these Regulations shall be payable in Swiss currency.

(b) Where the International Bureau has agencies, the Administrative Instructions may, under specified conditions, allow exceptions to paragraph (a).

31.4 *Deposit Accounts*

(a) Any natural person or legal entity may open a deposit account with the International Bureau or any of its agencies.

(b) The details concerning deposit accounts shall be provided in the Administrative Instructions.

31.5 *Indication of the Mode of Payment*

(a) Unless the payment is made in cash to the cashier of the International Bureau, the international application, and any request, demand, or other document, filed with the International Bureau in connection with any international registration, subject to the payment of any fee, shall indicate:

(i) the name and address, as provided in Rule 5.2(a) and (c), of the natural person or legal entity making the payment, unless the payment is made by a cheque attached to the document,

(ii) the mode of payment, which may be by an authorization to debit the amount of the fee to the deposit

account of such person or entity, or by transfer to a bank account or to the postal cheque account of the International Bureau, or by cheque. The Administrative Instructions shall provide the details, in particular those governing the kind of cheques that shall be accepted in payment.

(b) Where the payment is made pursuant to an authorization to debit the amount of the fee to a deposit account, the authorization shall specify the transaction to which it relates, unless there is a general authorization to debit to a specified deposit account any fee concerning a certain applicant, owner of an international registration, or duly appointed representative.

(c) Where the payment is made by transfer to a bank account or to the postal cheque account of the International Bureau, or by a cheque not attached to the international application, request, demand, or other document, the notification of the transfer or the cheque (or paper accompanying it) shall identify the transaction to which the payment relates, in the manner to be provided for in the Administrative Instructions.

31.6 *Effective Date of Payment*

Any payment shall be considered to have been received by the International Bureau on the date indicated hereinbelow:

(i) if the payment is made in cash to the cashier of the International Bureau, on the date on which such payment is made,

(ii) if the payment is made by debiting a deposit account with the International Bureau pursuant to a general authorization to debit, on the date on which the international application, the request for the recording of later designation, the demand for renewal or other document entailing the obligation to pay fees is received by the International Bureau, or in the case of a specific authorization to debit, on the date on which the specific authorization is received by the International Bureau,

(iii) if the payment is made by transfer to a bank account or to the postal cheque account of the International Bureau, on the date on which such account is credited,

(iv) if the payment is made by cheque, on the date on which the cheque is received by the International Bureau, provided that it is honored upon presentation to the bank on which the cheque is drawn.

RULE 32

Withdrawals and Renunciations

32.1 *Withdrawal of the International Application or Request for Recording of Later Designation*

(a) Any withdrawal of an international application shall be treated as such by the International Bureau if the communication of withdrawal reaches it before preparations for publication have been completed.

(b) Any withdrawal of a request for the recording of later designation shall be treated as such by the International Bureau if the communication of withdrawal reaches it before preparations for publication have been completed.

32.2 *Renunciation of the International Registration or of Certain Designations*

(a) The owner of the international registration may, at any time, renounce the international registration or the recording of the designation of any designated State.

(b) Renunciation of the recording of all designated States shall be treated as renunciation of the international registration.

32.3 *Procedure*

(a) Withdrawals and renunciations referred to in Rules 32.1 and 32.2 shall be effected in a written communication addressed to the International Bureau and signed by the applicant or the owner of the international registration, as the case may be. The International Bureau shall acknowledge receipt of this communication.

(b) In the case of any withdrawals, the International Bureau shall reimburse to the applicant or the owner of the international registration any State designation fee which it received from him in connection with any State affected by the withdrawal.

(c) The International Bureau shall record and publish renunciations, and shall notify interested designated Offices thereof. The details shall be provided in the Administrative Instructions.

RULE 33

Choice Between Individual and Standard State Fees

33.1 *Initial Choice*

Any Contracting State shall choose between individual and standard State fees in a written declaration addressed to the International Bureau at the same time as it deposits its instrument of ratification or accession. If it chooses individual State fees, the declaration shall also indicate the amounts of those individual State fees in Swiss francs. The choice of the Contracting State shall become effective and the amounts indicated shall be applicable from the date on which such State becomes bound by the Treaty. Where the Contracting State fails to indicate its choice at the prescribed time, or where it chooses individual State fees but fails to indicate their amounts in Swiss francs, it shall be considered to have chosen standard States fees.

33.2 *Change in Choice*

Any Contracting State may at any time indicate, in a written declaration addressed to the International Bureau, that it wishes to choose standard State fees instead of individual State fees or vice versa, provided that, in the latter case, the declaration shall indicate also the amounts of the individual State fees. The change in choice shall apply from January 1 of that calendar year which commences at the expiration of at least 6 months after the date on which the International Bureau received the declaration. If the desired change is for individual State fees but the declaration fails to indicate their amounts in Swiss francs, the declaration shall be treated as if it had not been made.

RULE 34

Change in the Amounts of Individual State Fees

34.1 *Communication; Effective Date*

Any change in the amounts of individual State fees, expressed in Swiss francs, shall be communicated in writing by the interested national Office to the International Bureau. The amounts so communicated shall be applicable as from January 1 of that calendar year which commences at the expiration of at least 6 months after the date on which the International Bureau receives the communication.

RULE 35

State Fees

35.1 *Individual State Fees*

(a) The International Bureau shall in every calendar year transfer to any interested designated Office the fees referred to in Article 18(3)(d) that are collected in re-

spect of international registrations, recordings of requests for later designations, and recordings of renewals, effected in the preceding calendar year.

(b) Further details shall be provided in the Administrative Instructions.

35.2. *Standard State Fees*

(a) The coefficient referred to in Article 18(4)(b) shall be:

(i) 2, if the national law provides only for examination of "absolute grounds of nullity,"

(ii) 3, if the national law provides for examination as to whether there is conflict with another mark ("relative grounds of nullity") and if such examination is carried out only where there is third-party opposition,

(iii) 4, if the national law provides for examination of relative grounds of nullity ex officio and without third-party opposition,

(iv) 5, if the national law provides for examination of relative grounds of nullity ex officio followed by the possibility of third-party opposition.

(b) Further details shall be provided in the Administrative Instructions.

RULE 36

Fees Belonging to the International Bureau

36.1 *Fees Belonging to the International Bureau*

All fees and charges collected under the Treaty, these Regulations and the Administrative Instructions, except those referred to in Article 18(2), shall belong to the International Bureau.

RULE 37

Recordings Effected by National Offices

37.1 *Notification*

The notification by the national Office provided for in Article 20(1) shall be made on a form furnished by the International Bureau and the details of which are provided in the Administrative Instructions.

37.2 *Annotation and Publication*

The Administrative Instructions shall provide for the extent to which annotations of any changes notified under Article 20(2) shall be made in the International Register of Marks and shall be published by the International Bureau, provided that such annotation and such publication shall at least indicate the international registration number of the mark, the State which it concerns, the date on which it was received, and its subject matter.

RULE 38

Changes in Addresses

38.1 *Recording and Publication*

(a) The International Bureau shall, on request, record and publish, free of charge, any change in the address of the owner of the international registration or his representative.

(b) The request shall be signed.

RULE 39

Recording and Publication Concerning Representatives

39.1 *Recording*

(a) Where a representative is appointed, the appointment shall be recorded.

(b) Where the appointment of a representative is revoked or renounced, the revocation or the renunciation shall be recorded.

39.2 *Publication*

(a) Where a representative is appointed, his appointment, including his name and address, shall be published.

(b) Where the appointment of a representative is revoked or renounced, the revocation or the renunciation shall be published unless, at the time the publication could be effected, the appointment of another representative is published.

RULE 40

The Gazette

40.1 *Contents and Title of the Gazette*

(a) All matters which, according to the Treaty or these Regulations, the International Bureau is obliged to publish shall be published in a periodical entitled "International Marks Gazette/*Gazette internationale des marques*".

(b) The Administrative Instructions may provide for the inclusion of other matters in the Gazette.

40.2 *Frequency of Issue of the Gazette*

The Gazette shall be issued once a week.

40.3 *Languages of the Gazette*

(a) The Gazette shall be issued in a bilingual (English and French) edition.

(b) The Administrative Instructions shall identify those portions which require translation and those portions which do not require translation.

(c) Matters which can be easily understood even if not translated (for example, the names of the designated States), or which are indicated by signs or abbreviations (for example, "Ren." for "Renewal/*Renouvellement*") to which the keys shall be published in each issue, need not be translated. The details shall be provided in the Administrative Instructions.

(d) Matters not falling within the scope of paragraph (c) (for example, the lists of goods and/or services) shall always be published in both languages. The publication shall indicate which is the original language. Translations shall be prepared by the International Bureau. In case of any divergence between the original and the translation, all legal effects shall be governed by the original.

40.4 *Sale of the Gazette*

The subscription and other sale prices of the Gazette shall be fixed in the Administrative Instructions.

40.5 *Copies of the Gazette for National Offices*

(a) Before July 1 of each year each national Office shall notify the International Bureau of the number of copies of the Gazette which it wishes to receive in the next subsequent year.

(b) The International Bureau shall make the requested number of copies available to the national Office:

(i) free of charge, up to the same number as the number of units corresponding to the class chosen under the Paris Convention for the Protection of Industrial Property by the Contracting State of which the said Office is the national Office,

(ii) at half of the ordinary subscription or sale price, for copies in excess of the said number.

(c) Copies given free of charge or sold under paragraph (b) shall be for the internal use of the national Office which has requested them.

40.6 *Errors in Publications*

(a) Any error in the Gazette may be rectified by the International Bureau through publication of an appropriate corrigendum.

(b) Any national Office and any interested person may call any error in the Gazette to the attention of the International Bureau.

40.7 *Further Details*

Further details concerning the Gazette may be provided in the Administrative Instructions.

RULE 41

Copies and Other Information Available to the Public

41.1 *Copies and Information Concerning International Applications and International Registrations*

(a) Any person may obtain from the international Bureau, against payment of a fee whose amount shall be fixed in the Administrative Instructions, certified or uncertified copies or extracts of the international registration or of any document in the file of any international application or international registration. Each copy or extract shall reflect the situation of the international registration or of the file, or parts of such registration or file, on a specific date; such date shall be indicated in the said copy or extract.

(b) On request and against payment of a fee whose amount shall be fixed in the Administrative Instructions, any person may obtain from the International Bureau oral or written information, or information by telecopier devices, on any fact appearing in any document in the file of any international application or international registration.

(c) Notwithstanding paragraphs (a) and (b), the Administrative Instructions may waive the obligation to pay any fee where the work or the expense connected with the furnishing of a copy, extract, or information is minimal.

RULE 42

Regional Marks

42.1 *Declaration Under Article 25(1)(a)*

(a) The declaration referred to in Article 25(1)(a) shall be in writing and shall be addressed to the International Bureau. It shall be effective as from the date or event specified in the declaration, provided that it shall not become effective prior to the expiration of 2 months from the receipt of the declaration by the International Bureau.

(b) The declaration shall be promptly published by the International Bureau.

42.2 *Fees*

Rules 9, 13, 25.3, 33 and 34 shall apply *mutatis mutandis*, in the case referred to in Article 25(2).

RULE 43

Procedure Where Correction of Errors of the International Bureau is Sought

43.1 *Time Limit Under Article 30*

The time limit referred to in Article 30(1) shall be:

(i) where the alleged error may be discovered on the basis of a notification sent by the International Bureau to the applicant or the owner of the international registration, 2 months from the date of such notification,

(ii) where item (i) does not apply and the alleged error may be discovered on the basis of a publication of the International Bureau, 2 months from the date of such publication,

(iii) where neither item (i) nor item (ii) applies, the time limit provided for in the national law.

43.2. *Application of Rule 16*

Rule 16 shall apply, *mutatis mutandis*, in respect of Article 30.

RULES CONCERNING CHAPTER II

RULE 44

Expenses of Delegations

44.1 *Expenses Borne by Governments*

The expenses of each delegation participating in any session of the Assembly and in any committee, working group or other meeting dealing with matters of concern to the Union shall be borne by the Government which has appointed it.

RULE 45

Absence of Quorum in the Assembly

45.1 *Voting by Correspondence*

(a) In the case provided for in Article 32(5)(b), the International Bureau shall communicate any decision of the Assembly (other than decisions relating to the Assembly's own procedure) to the Contracting States which were not represented when the decision was made and shall invite them to express in writing their vote or abstention within a period of 3 months from the date of the communciation.

(b) If, at the expiration of the said period, the number of Contracting States having thus expressed their vote or abstention attains the number of Contracting States which was lacking for attaining the quorum when the decision was made, that decision shall take effect provided that at the same time the required majority still obtains.

RULE 46

Administrative Instructions

46.1 *Establishment of Administrative Instructions; Matters Governed by Them*

(a) The Director General shall establish Administrative Instructions. He may modify them. They shall deal with matters in respect of which these Regulations expressly refer to such Instructions and with details in respect of the application of these Regulations.

(b) Before establishing the Administrative Instructions and before modifying any provision thereof which affects national Offices, the Director General shall communicate to the interested Offices the text of the intended provisions and shall invite the said Offices to notify him of any observations they might wish to make.

(c) All forms of interest to applicants and owners of international registrations shall be included in the Administrative Instructions.

46.2 *Control by the Assembly*

The Assembly may invite the Director General to modify any provision of the Administrative Instructions, and the Director General shall proceed accordingly.

46.3 *Publication and Effective Date*

(a) The Administrative Instructions and any modification thereof shall be published in the Gazette.

(b) Each publication shall specify the date on which the published provisions become effective. The date need not be the same for all the provisions provided that no provision may be declared effective prior to the expiration of a period of one month after the publication date of that issue of the Gazette in which it was published.

46.4 *Conflict with the Treaty and the Regulations*

In the case of conflict between any provision of the Administrative Instructions and any provision of the Treaty or of these Regulations, the latter shall prevail.

ANNEX TO THE REGULATIONS

TABLE OF FEES

The fees marked by an asterisk apply to the States which have chosen the standard State fee system (see Articles 18(2) and (4)). Where, either because of the choice exercised by the applicant or the owner of the international registration under Article 5(1)(a)(vi) or 6(2)(a)(v), or because only a regional mark is available, the designation of one or more States party to a regional treaty has the same effect as if an application for the registration of the mark in the regional register of marks had been filed, the fees marked by an asterisk shall be payable once even if the regional registration effect extends to more than one State party to the regional treaty.

Kind of Fee	*Amount in Swiss francs*
1. *Application*	
1.1 International Application Fee (Rule 9.1(a)(i)): irrespective of the number of designated States and of the numbers of classes	400
1.2 *Standard State Designation Fee (Rule 9.1(a)(ii)): for each designated State to which the Standard Fee System applies	[1] 30
1.3 Color Reproduction Fee (Rule 9.1(a)(i))	100
2. *Later Designation*	
2.1 International Later Designation Fee (Rule 13.1(a)(i)): irrespective of the number of designated States and of the number of classes	100
2.2 *Standard State Designation Fee (Rule 13.1(a)(ii)): for each designated State to which the Standard Fee System applies	[1] 30
2.3 Color Reproduction Fee (Rule 13.1(a)(ii))	100
3. *Change in Ownership*	
3.1 Request for Recording Change in Ownership Fee (Rule 22.1(g))	100
4. *Change in the Name of the Owner—Request for Recording Change in the Name of the Owner (Rule 23.1(c)):*	
4.1 Where the request relates to one international registration	100
4.2 Where the request relates to more than one international registration	[2] 50
5. *Limitation of List of Goods and/or Services*	
5.1 Request for Recording of Limitation of the List of Goods and/or Services Fee (Rule 24.1(c))	100
6. *Renewal*	
6.1 International Renewal Fee (Rule 25.3(a)(i)): irrespective of the number of designated States and of the number of classes	400
6.2 Renewal Surcharge (Rule 25.3(a)(i)): irrespective of the number of designated States and of the number of classes	200
6.3 *Standard State Renewal Fee (Rule 25.3(a)(ii)): for each designated State to which the Standard Fee System applies	[1] 30
6.4 Color Reproduction Fee (Rule 25.3(a)(i))	100

[1] Multiplied by the number of classes.

[2] For each of the international registrations to which it relates.

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[Printed in Official Gazette, July 24, 1973]

PATENT OFFICE NOTICES

Late Submission of Formal Drawings

In those situations where an application is filed with informal drawings, applicants are requested to wait until they receive their "Notice of Informal Drawings" form, PO–1094, from the Group Art Unit before submitting the formal drawings and the comparison fee. The letter of transmittal accompanying the formal drawings should identify the Group Art Unit indicated on Form PO–1094. Also, each sheet of drawing should include the serial number and Group Art Unit in the upper right margin. In the past, some drawings have been misdirected because the Group Art Unit indicated on the filing receipt was used rather than that indicated on Form PO–1094.

WILLIAM FELDMAN,
June 28, 1973. *Acting Assistant Commissioner for Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,801,941, S. C. Johnson, METHOD OF CLEANING RAILWAY CARS AND THE LIKE, **filed** June 30, 1972, D.C., M.D. Fla. (Jacksonville), Doc. 72–478–C–J–M, *Chemed Corporation* v. *Jacksonville Robo, Inc.* Notice of dismissal pursuant to Rule 41(a)(1)(i), Nov. 3, 1972.

2,839,196, W. C. Schwalge, OIL RECLAIMER, **filed** Feb. 14, 1972, D.C., W.D. Okla. (Oklahoma City), Doc. 72–95–C, *Prelin Industries, Inc.* v. *G & G Crafts, Inc. and George E. Barrow.* No infringement of U.S. patent by defendants, Sept. 15, 1972.

2,956,114, Ginsburg, Henderson, Dolby, and Anderson, BROAD BAND MAGNETIC TAPE SYSTEM AND METHOD, **filed** Aug. 4, 1972, D.C., N.D. Ill. (Chicago), Doc. No. 72c1929, *Ampex Corp.* v. *Avco Corp. et al.*

2,984,841, N. E. Wilson, TOILET BOWL DEODORIZERS AND HOLDERS THEREFOR, **filed** Oct. 30, 1972, D.C., E.D. Mo. (St. Louis), Doc. 72C681(1), *Irwin-Willert Co.* v. *Puro Xo, Inc.*

3,304,636, Viecelli and Walczak, HEATING AND SYSTEM GENERATING SUBASSEMBLY FOR A PRESSING IRON; **3,335,507,** J. L. Viecelli, same; **3,541,306,** Barnas and Gronwick, ELECTRIC PRESSING IRON; **3,599,357,** Gronwick and Westphal, same; **3,691,660,** Gronwick, Illian and Westphal, same, **filed** Dec. 7, 1972, D.C. Del. (Wilmington), Doc. 4533, *Scovill Manufacturing Company* v. *Sunbeam Corporation.*

3,335,507. (See 3,304,636.)

3,361,476, E. G. Smock, DUMPING VEHICLE HAVING AN AUXILIARY DISCHARGE, **filed** Dec. 29, 1972, D.C., S.D. Ohio (Columbus), Doc. 72–492, *Edmund G. Smock, doing business as D. & L.E. Transit Company* v. *Robert B. Miller.* **Same, filed** Dec. 29, 1972, D.C., S.D. Ohio (Columbus), Doc. 72–493, *Edmund G. Smock, doing business as D. & L.E. Transit Company* v. *Ideal Transportation Company and Russell E. Scott.*

3,478,700, Lundvall, Loomis and Breen, FLOOR LATCH STRIP FOR RAILWAY CARS, **3,570,416,** J. A. Shook, FREIGHT-BRACING APPARATUS, **filed** Oct. 4, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2492, *Unarco Industries, Inc.* v. *Evans Products Company et al.*

3,541,306. (See 3,304,636.)

3,553,374, Wolf and Marino, ACOUSTIC COUPLER, **filed** Feb. 18, 1971, D.C.N.J. (Newark), Doc. C–222–71, *Digitronics Corporation* v. *MSI Data Corporation.* Stipulation and order of dismissal of action, Dec. 26, 1972.

3,570,416. (See 3,478,700.)

3,599,357. (See 3,304,636.)

3,691,660. (See 3,304,636.)

3,701,298, Heller and Kelly, DE-REELING APPARATUS FOR ELECTRICAL COMPONENTS, **filed** Dec. 23, 1972, D.C.N.J. (Newark), Doc. C–20–14–72, *Heller Industries, Inc.* v. *Dundas Engineering & Manufacturing Co. et al.*

Plant Patents 1,360, E. G. Fisher, ROSE PLANT; **1,469,** F. Meilland, same; **1,758,** same; **1,759,** same; **1,912,** F. Meilland, deceased, by M. L. Meilland, nee Paolino, legal representative, same; **1,943,** same; **2,017,** Swim and Weeks, same; **2,032,** same; **2,037,** S. C. Johnston, same; **2,055,** C. Camprubi, same; **2,278,** E. McCummings, same; **2,329,** P. Shamburger, same; **2,349,** A. Meilland, same; **2,370,** Swim and Weeks, same; **2,371,** same; **2,444,** A. Meilland, same; **2,500,** P. Croix, same; **2,540,** G. de Ruiter, same; **2,576,** E. G. Fisher, same; **2,597,** M. L. Meilland, same; **2,625,** same; **2,691,** same; **2,692,** same; **2,693,** same; **2,746,** R. G. Jelly, same; **2,792,** Swim and Weeks, same; **2,854,** J. D. Lissemore, Same; **2,855,** Swim and Weeks, same; **3,097,** C. Meyer, same, **filed** Dec. 15, 1972, D.C., E.D. Mich. (Detroit), Doc. 39376, *Conard-Pyle* v. *Frank's Nursery Sales, Inc.*

P.P. 1,469. (See P.P. 1,360.)

P.P. 1,758. (See P.P. 1,360.)

P.P. 1,759. (See P.P. 1,360.)

P.P. 1,912. (See P.P. 1,360.)

P.P. 1,943. (See P.P. 1,360.)

P.P. 2,017. (See P.P. 1,360.)

P.P. 2,032. (See P.P. 1,360.)

P.P. 2,037. (See P.P. 1,360.)

P.P. 2,055. (See P.P. 1,360.)

P.P. 2,278. (See P.P. 1,360.)

P.P. 2,329. (See P.P. 1,360.)

P.P. 2,349. (See P.P. 1,360.)

P.P. 2,370. (See P.P. 1,360.)

P.P. 2,371. (See P.P. 1,360.)

P.P. 2,444. (See P.P. 1,360.)

P.P. 2,500. (See P.P. 1,360.)

P.P. 2,540. (See P.P. 1,360.)

P.P. 2,576. (See P.P. 1,360.)

P.P. 2,597. (See P.P. 1,360.)

P.P. 2,625. (See P.P. 1,360.)

P.P. 2,691. (See P.P. 1,360.)

P.P. 2,692. (See P.P. 1,360.)

P.P. 2,693. (See P.P. 1,360.)

P.P. 2,746. (See P.P. 1,360.)

P.P. 2,792. (See P.P. 1,360.)

P.P. 2,854. (See P.P. 1,360.)

P.P. 2,855. (See P.P. 1,360.)

P.P. 3,097. (See P.P. 1,360.)

Erratum

In the OFFICIAL GAZETTE for February 27, 1973, page 861, all reference to the inadvertent issuance of Patent No. 3,712,975 to Joseph B. Allen and Henry E. Lippman for Line Segment Intersection Test should be deleted as Patent No. 3,712,975 did, in fact, issue on January 23, 1973.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 7, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-30-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-01-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-03-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-24-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-01-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-29-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-16-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-23-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-13-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	7-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-02-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-16-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-15-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-03-72

Expiration of patents: The patents within the range of numbers indicated below expire during July 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,752,595 to 2,757,377, inclusive
Plant Patents..... Numbers 1,492 to 1,504, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 24, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T912,009
PROCESS OF PREPARING POLYURETHANE POLYUREA FOAMS HAVING INTEGRAL SKIN

Albert Pierre Strassel, 4 Avenue des Cedres, Domaine de la Ronce, 92 Ville d'Auray, France, and Dominique Jeandot, 1 Rue Renoir, Garges-les-Gonesse, France

Continuation of application Ser. No. 619,021, Feb. 27, 1967. This application Dec. 10, 1971, Ser. No. 206,859
Claims priority, application France, Mar. 2, 1966, 51,755
Int. Cl. C08g *22/46*
U.S. Cl. 264—45
No Drawing. 17 Pages Specification

A process for preparing a cellular polyurethane-polyurea composition having a resistant, strong molding skin that remains bonded to said cellular composition and exhibits no visible porosity to the naked eye, and a foam density greater than 150 grams per liter by

(A) preparing a reaction mixture by mixing a polyisocyanate, a polyoxyalkylene polyol having an average molecular weight between about 130 and 6,000, an aromatic polyamine, a foaming agent, and a catalyst for the polyurethane-polyurea reaction the NH_2/OH ratio being between 0.3 and 5/1, the $NCO/OH+NH_2$ ratio being between 0.9 and 2/1, the amount of foaming agent being from 0.5 to 50 weight percent of the weight of the reaction mixture, the amount of catalyst being from 0 to 2 weight percent of the combined weight of said polyol and said aromatic polyamine, the mixing being carried out at a temperature in the range of about 0° to 140° C.;

(B) introducing the reaction mixture into a mold, which is at a temperature between about 20° and 140° C., wherein the reaction and expansion take place;

(C) after completion of the expansion, placing the mold in an oven maintained at a temperature in the range of about 20° to 140° C.; and

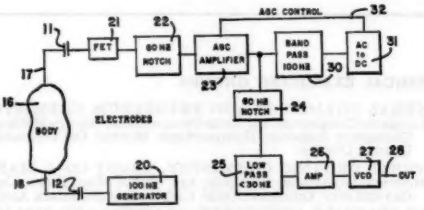
(D) after a period of from about 5 to 30 minutes removing the mold from said oven and demolding the resulting cellular composition.

T912,010
FINGERTIP EGG MONITOR UTILIZING CARRIER INJECTION FOR AGC

William P. Holsinger, Herndon, Va., assignor to the United States of America as represented by the Secretary of Department of Health, Education, and Welfare

Filed May 1, 1972, Ser. No. 249,240
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R
1 Sheet Drawing. 10 Pages Specification

A mass screening system for electrocardiographic abnormalities features a constant 100 Hz. tone generator **20** coupled to the subjects' body via capacitive electrode **12** and a sensing system for picking up the electrocardiographic signal-modified tone including capacitive electrode **11**, amplifier **21**, 60 cycle filters **22**, amplifier **23** and 60 cycle filter **24**. The gain of amplifier **23** is automatically controlled by a feedback loop which has a filter **30** to eliminate all but the tone whose fluctuating amplitude is then converted to a D.C. control signal by converter **31** and introduced via lead **32** into the amplifier to adjust the gain thereof. At the output of the 60 cycle filter **24**, a low pass filter **25** is provided to remove the 100 Hz. tone from the electrocardiographic information. The information is then amplified in amplifier **26** and used



as a modulating signal for the variable frequency oscillator **27** resulting in a frequency modulated signal at **28** for transmission, over telephone lines for example, to a remote monitoring station.

T912,011
SMOKING PRODUCT

John A. Harpham, Carrcroft, and Eugene D. Klug, Hillcrest, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed June 30, 1972, Ser. No. 267,801
Int. Cl. A24b *3/00, 3/14*
U.S. Cl. 131—2
No Drawing. 8 Pages Specification

A smoking product is prepared by thermoforming a mixture of hydroxypropyl cellulose, an inorganic ashing material, and, optionally, an organic filler. The hydroxypropyl cellulose can be plain hydroxpropyl cellulose or a modification thereof such as benzyl-, phenylhydroxyethyl-, or hydroxybutyl hydroxypropyl cellulose which would have a lower cloud point and thus be less moisture sensitive. Optionally the hydroxypropyl cellulose can be foamed slightly to modify the combustion characteristics thereof. The inorganic material is preferably an alkali or alkaline earth metal compound in particulate form from about 25 to 200 mesh. The optional organic filler is a physiologically inert, combustible material which modifies the combustion characteristics of the hydroxypropyl cellulose.

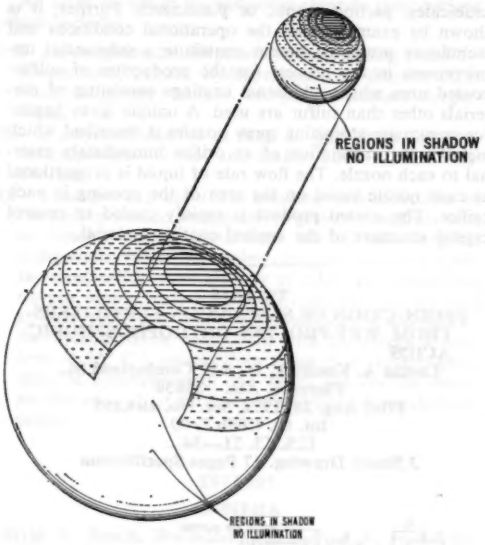
T912,012
METHOD AND SYSTEM FOR GENERATING SHADED PICTURES

Arthur Appel and Joseph E. Harry, Yorktown Heights, and Arthur J. Stein, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1972, Ser. No. 267,801
Int. Cl. G06k *15/20;* **G06f** *3/14*
U.S. Cl. 444—1
16 Sheets Drawing. 42 Pages Specification

A method for use in a computer for generating shaded renderings of a scene which comprises the treating of each surface in the scene as a plurality of horizontal scan lines and the treating of each scan line on a surface as a plurality of segments. In a first embodiment of the

method, there are provided specific values for illumination intensity for each surface and random number values, the minimum random number value being less than or equal to lowest value illumination intensity value for any of the surfaces. As a segment of a line is considered, the illumination intensity of the surface it falls on is compared with the random number concurrently being generated. If the random number is less than illumination intensity, then the line segment is drawn, i.e., illuminated. However, if the random number concurrently exceeds the



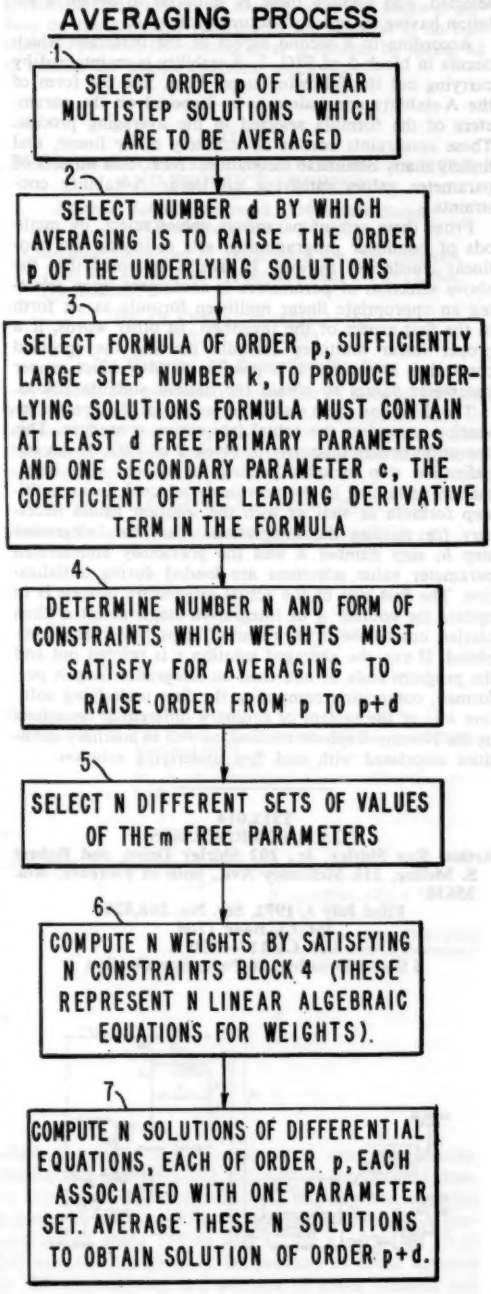
generated segment's illumination intensity, then the segment is not drawn, i.e., not illuminated. In a second embodiment, each segment is provided with a value which is the sum of its orthographic or perspective projection coordinates, X and Y. If the illumination intensity of the surface on which the segment being considered currently lies falls within a chosen range of coordinate sums and if the sums of the X and Y coordinates of the segment is an integer multiple of a function of the illumination intensity of the segment, then the segment is drawn.

T912,013
HIGHLY ACCURATE UNCONDITIONALLY STABLE METHOD FOR INTEGRATING ORDINARY DIFFERENTIAL EQUATIONS

Werner Liniger and Farouk M. Odeh, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1972, Ser. No. 267,806
Int. Cl. G06f *15/32*
U.S. Cl. 444—1
8 Sheets Drawing. 52 Pages Specification

The present invention generally relates to a novel method for operating an electronic computer to perform integration operations upon a set of ordinary differential equations. The overall method is illustrated in the flow chart of FIG. 1. According to a first aspect of the invention occurring in block 7 of FIG. 1, there is disclosed an averaging process comprising the following steps. Select an order of accuracy p for the underlying linear multistep formulae solutions which are to be averaged. Select a number d by which the averaging process is to raise the order of accuracy p of the individual underlying solutions. Select a linear multistep formula of order p and a sufficiently large step number k to produce underlying solutions, wherein the formula must contain


AVERAGING PROCESS
1
SELECT ORDER p OF LINEAR MULTISTEP SOLUTIONS WHICH ARE TO BE AVERAGED
2
SELECT NUMBER d BY WHICH AVERAGING IS TO RAISE THE ORDER p OF THE UNDERLYING SOLUTIONS
3
SELECT FORMULA OF ORDER p, SUFFICIENTLY LARGE STEP NUMBER k, TO PRODUCE UNDERLYING SOLUTIONS FORMULA MUST CONTAIN AT LEAST d FREE PRIMARY PARAMETERS AND ONE SECONDARY PARAMETER c, THE COEFFICIENT OF THE LEADING DERIVATIVE TERM IN THE FORMULA
4
DETERMINE NUMBER N AND FORM OF CONSTRAINTS WHICH WEIGHTS MUST SATISFY FOR AVERAGING TO RAISE ORDER FROM p TO p+d
5
SELECT N DIFFERENT SETS OF VALUES OF THE m FREE PARAMETERS
6
COMPUTE N WEIGHTS BY SATISFYING N CONSTRAINTS BLOCK 4 (THESE REPRESENT N LINEAR ALGEBRAIC EQUATIONS FOR WEIGHTS).
7
COMPUTE N SOLUTIONS OF DIFFERENTIAL EQUATIONS, EACH OF ORDER p, EACH ASSOCIATED WITH ONE PARAMETER SET. AVERAGE THESE N SOLUTIONS TO OBTAIN SOLUTION OF ORDER p+d.

at least $m \geq d$ free primary parameters and one secondary parameter c, the coefficient of the leading derivative found in the formula. Determine the number N and form of the constraints which the weights must satisfy for the

averaging process to raise the order from p to $p+d$. Select N different sets of values of the free parameters. Compute the N weights satisfying the N constraints. Compute N solutions of the differential equations, each of order p, each associated with one of the parameter sets selected, and average these N solutions to obtain a solution having an order of accuracy of $p+d$.

According to a second aspect of the invention which occurs in block 3 of FIG. 1, A-stability is maintained by carrying out the following steps. First, find the form of the A-stability constraints to be imposed on the parameters of the formula selected in the averaging process. These constraints consist of infinitely many linear, and finitely many nonlinear inequalities. Next, find all sets of parameter values satisfying all linear A-stability constraints.

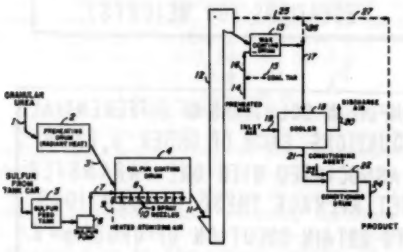
From these sets of parameter values select, by methods of nonlinear programming, sets satisfying the nonlinear constraints as well. It should be noted that the above selection of parameters is contingent upon selecting an appropriate linear multistep formula as set forth in the first aspect of the invention. In other words, if a proper linear multistep formula meeting the specified constraints is chosen, it is possible to also select proper parameter values to obtain the desired stability results.

The third and most significant aspect of the present invention comprises the actual integration procedure. This operation occurs primarily in block 7 of FIG. 1. An initialization step includes loading the system with information pertaining to the previously selected linear multistep formula as well as with the solution values necessary for starting the integration. Also, the integration step h, step number k and the previously enumerated parameter value selections are loaded during initialization. The first step of the actual integration process is to update the counter n of integration steps, a test is then carried out to see if all required steps have been completed. If yes, the averaged solution z is printed out and the program ends. If not, then an integration step is performed, comprising computing the first underlying solution $x^{(1)}$ of the system of ordinary differential equations by the Newton-Raphson method, as well as auxiliary quantities associated with said first underlying solution.

T912,014
COATING PROCESSES

Arthur Ray Shirley, Jr., 202 Shirley Drive, and Robert S. Meline, 310 McKinley Ave., both of Florence, Ala. 35630

Filed July 3, 1972, Ser. No. 268,520
Int. Cl. B44d *1/08*
U.S. Cl. 117—100 A
6 Sheets Drawing. 26 Pages Specification

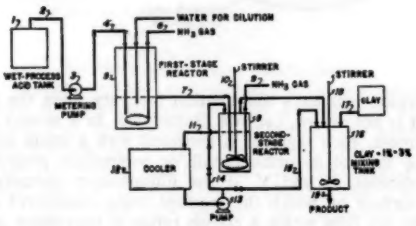


A process for applying a precisely uniform solid coating of fluid material onto solid substrate particles wherein said particles are preheated in a rotary drum having a radiant heat source such that the surface irregularities of said particles are smoothed out by a combination of surface melting and tumbling action. The preheat particles are fed to a second rotary drum where multiple, thin, concentrically formed layers of the coating material are applied by cascading the substrate particles beneath a plurality of sequentially applied, closely controlled sprays of the coating material. In particular, the process allows the coating of granular urea with molten sulfur applied under precise spraying temperatures and conditions in such a manner that the molten sulfur evenly coats the particles and solidifiers with the desired physical characteristics to form a slow release nitrogen fertilizer at an economical cost without the use of subcoats, seal coats, microbicides, parting agents, or plasticizers. Further, it is shown by examples that the operational conditions and techniques presented herein constitute a substantial improvement in the process for the production of sulfur-coated urea where additional coatings consisting of materials other than sulfur are used. A unique spray header for pneumatic atomizing spray nozzles is described which includes the installation of an orifice immediately external to each nozzle. The flow rate of liquid is proportional to each nozzle based on the area of the opening in each orifice. The coated product is rapidly cooled to control crystal structure of the applied coating material.

T912,015
PRODUCTION OF SUSPENSION FERTILIZERS FROM WET-PROCESS ORTHOPHOSPHORIC ACIDS

Lucian A. Kendrick, Jr., 919 Cumberland St., Florence, Ala. 35630

Filed Aug. 28, 1972, Ser. No. 284,155
Int. Cl. C05b *7/00*
U.S. Cl. 71—34
3 Sheets Drawing. 17 Pages Specification



Gel-like precipitates identified as hydrated iron, aluminum, magnesium, and other metallic compounds occur in ammonium phosphate suspension fertilizers made from wet-process orthophosphoric acids. These small, hydrated, amorphous precipitates either destroy or decrease the fluidity of concentrated suspensions and they cannot be pumped, poured, or distributed to the soil. During storage, viscosity increases and the products frequently solidify. The dilution, during production, required for restoring fluidity decreases product grade and reduces the economic advantages gained from use of wet-process orthophosphoric acids.

A method of preventing formation of the amorphous, hydrated, gel-like materials that are derived from impurities in the acids has been found and satisfactory fluid high-grade suspensions can be economically produced. The new process involves ammoniating the acids in two or more stages. For best results, pH in the first stage should be in the range of 3.5 to 4.5; temperature, boiling; and time of retention, 30 to 60 minutes. Second stage retention time of 5 to 10 minutes is satisfactory and the temperature should be held to about 160° F. The suspension, pH about 5.9, may have a grade 12–40–0 or higher.

T912,016

ADHESIVE POLYMERIC COMPOSITIONS

Lloyd P. Foster, Albert D. Beeler, and David L. Valentine, all of P.O. Box 511, Kingsport, Tenn. 37662

Continuation of application Ser. No. 135,431, Apr. 19, 1971, which is a division of application Ser. No. 732,891, May 29, 1968, both now abandoned. This application Sept. 25, 1972, Ser. No. 292,687

Int. Cl. C08g *39/06*
U.S. Cl. 252—186

No Drawing. 12 Pages Specification

An additive system for polyvinyl chloride compositions which includes

(1) a hydroperoxide component such as tertiary butyl hydroperoxide, cumene hydroperoxide, 2,5-dimethyl,-2,5-bis(hydroperoxy) hexane, and para-methane hydroperoxide,

(2) a polyester derived at least in part from 2,2,4-trimethylpentane-1,3-diol and maleic acid or maleic anhydride,

(3) a complexing agent for inducing decomposition of the hydroperoxide component to give free radicals such as variable valence metal ions, autooxidative organic compounds, sulfur containing compounds having a tetra-valent sulfur atom directly attached to at least one oxygen atom, acids having an ionization constant of at least 10^{-3}, and crystalline substances which absorb the hydroperoxide component with an energy (measured at 23° C.) greater than about three kilocalories/mole of hydroperoxide, and which desorbs the resultant free radicals of the decomposed hydroperoxide component.

T912,017

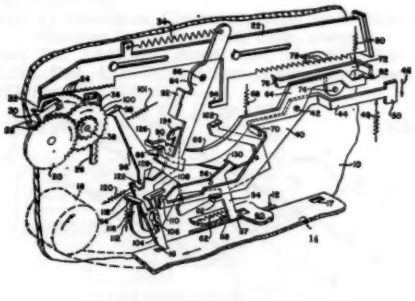
CAMERA

David E. Beach, Rochester, and Jeffrey R. Stoneham, Hilton, N.Y. (both of 901 Elmgrove Road, Rochester, N.Y. 14650)

Continuation of abandoned application Ser. No. 203,733, Dec. 1, 1971. This application Nov. 5, 1972, Ser. No. 306,970

Int. Cl. G03b *19/04*
U.S. Cl. 95—31 FL

5 Sheets Drawing. 10 Pages Specification



A camera adapted to receive a film cartridge containing roll film perforated at predetermined metering intervals includes a film advancing mechanism which is locked against further film transport when a fresh frame is in registry with the camera's exposure area. A shutter release lever is operable to effect exposure of the film, and a double exposure prevention mechanism prevents depression of the shutter release lever prior to transport of another frame to the camera exposure area upon completion of an exposure. The double exposure prevention mechanism is automatically disabled whenever a cartridge is not located in the camera. A sensing lever **54** abuts a surface on the cartridge received in the camera. If no cartridge is present, the sensing lever is rotated by spring **62** to disable the double exposure mechanism.

T912,018

PROCESS FOR PREPARING A BONDED ARTICLE AND PRODUCT THEREOF

Michael John Maskornick, 530 Marsh Road, Wilmington, Del. 19809

Continuation-in-part of application Ser. No. 280,889, Aug. 15, 1972. This application Jan. 10, 1973, Ser. No. 322,687

Int. Cl. C09j *5/00*; B32b *15/08*
U.S. Cl. 156—333

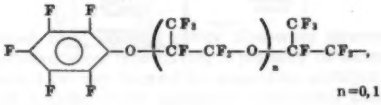
No Drawing. 16 Pages Specification

A process for producing a laminate of a metal selected from the group consisting of aluminum, copper, iron, titanium, nickel and alloys thereof with a perfluorinated elastomeric polymer prepared by polymerizing the following monomers:

$CF_2=CF_2$, $CF_2=CFOCF_3$, and $CF_2=CFOR_f$

wherein R_f is selected from the group consisting of

(1)



n=0, 1

(2)

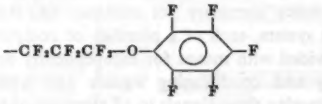
$-(CF_2)_n-X$ X=CN, COF, CO_2H, CO_2R_1, CO_2M, or $CONR_2R_3$
M=alkali metal
R_1=alkyl radical of C_1-C_{10}
R_2, R_3=R_1 or hydrogen or combinations thereof
n=2-12,

(3)

$-CF_2CFY-\left(OCF_2CFY\right)_n-OCF_2CFR'_fSO_2M'$

R'_f=perfluoroalkyl of C_1-C_{10}
Y=F, CF_3,
n=1, 2
M'=F, OH, NH_2, OMe where Me=alkali metal or quaternary ammonium or

(4)



which comprises coating said metal with an adhesive, placing said perfluorinated polymer, in the uncured state, on said adhesive, thereby forming an assembly, applying pressure to said assembly, heating the assembly to a temperature of about 170 to 250° C. for a period of 10 to 240 minutes, reducing the temperature to about ambient to 100° C., reducing said pressure to about ambient and recovering a laminate of said metal, said adhesive and said polymer.

The resulting product may be used as a solvent-resistant lining for tank cars or formed into a roll for various purposes such as use as a tin plate roller.

REISSUES

JULY 24, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

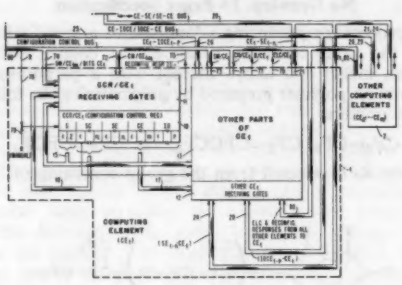
27,703

CONFIGURATION CONTROL IN MULTIPROCESSORS

Thomas S. Stafford, Wappingers Falls, Donald C. Burnstine, Hyde Park, Gerard T. Paul, Poughkeepsie, and John R. Rogaski, Woodstock, N.Y., by International Business Machines Corp., Armonk, N.Y., assignee

Original No. 3,386,082, dated May 28, 1968, Ser. No. 460,776, June 2, 1965. Application for reissue Sept. 5, 1972, Ser. No. 288,182

Int. Cl. G06f *9/00, 11/00*
U.S. Cl. 340—172.5 18 Claims



The present multiprocessor apparatus includes, in effect, a distributed interconnection system such that failure of a portion of the interconnection system does not completely disable the apparatus. Each element—of a plurality of computing elements, a plurality of storage elements, and a plurality of other information processing elements of the total multiprocessor apparatus—is equipped with an individual Configuration Control Register for selectively controlling the flow of information between the respective element and other elements of the apparatus. For controlling the interconnection system represented by the Configuration Control Registers, with the redundancy necessary for reliable "fail-safe" operation of the system, each of a plurality of computing elements is provided with means for independently developing, selecting and conditioning signals and with means for broadcasting these signals to all elements of the apparatus, including the originating element. The selecting signals are utilized at the receiving elements to selectively limit application of the conditioning signals only to Configuration Control Registers of elements designated by the selecting signals, such elements having been predetermined by the originating computing element. The conditioning signals serve to condition the Control Registers of the selected elements to desired states of information flow control also predetermined by the originating computing element.

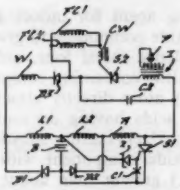
27,704

IGNITION SYSTEM

Thomas F. Carmichael, Drayton Plains, and Richard J. Maier, Pontiac, Mich., assignors to Syncro Corporation, Oxford, Mich.

Original No. 3,358,665, dated Dec. 19, 1967, Ser. No. 503,986, Oct. 23, 1965. Application for reissue Nov. 23, 1970, Ser. No. 76,834

Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E 47 Claims



A solid state ignition system in combination with an electrical generating device for generating electrical power for an engine.

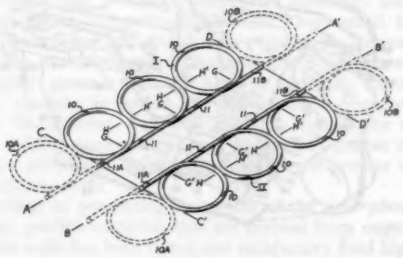
27,705

CORD TYPE CONTAINER CARRIER

James D. Rockett, Eagle, Wis., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Original No. 3,480,135, dated Nov. 25, 1969, Ser. No. 693,856, Dec. 27, 1967. Application for reissue July 27, 1971, Ser. No. 166,553

Int. Cl. B65d *21/02, 71/00, 85/62*
U.S. Cl. 206—65 C 13 Claims



A carrying unit for a plurality of containers and the like being comprised of two series of loops, each series of said

loops being comprised of a cord or ribbon being wound or placed upon a series of containers to co-mate in a gripping manner, said loops being formed or welded from a single strand or a plurality of strands, embodiments being comprised of two strands per series of loops being welded, twisted and welded or otherwise joined to form complete loops, said series of said loops then being joined together to form a package unit having two parallel rows of clustered containers.

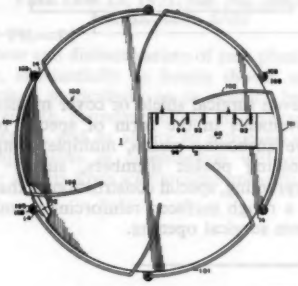
27,706
MACHINE FOR GATHERING, STACKING AND TRANSPORTING HAY

Raymond R. Carson, 1374 C St., Independence, Oreg. 97351

Original No. 3,538,696, dated Nov. 10, 1970, Ser. No. 766,532, Oct. 10, 1968. Application for reissue Nov. 8, 1971, Ser. No. 196,702

Int. Cl. A01d *85/00*

U.S. Cl. 56—350 9 Claims



A machine for gathering hay from a windrow and stacking it on a superimposed platform on the machine for transportation to a storage building, barn or feed lot. The machine is preferably, though not restrictively, of a trailer type including self-contained power driven circumferentially rotatable sweepers or arms for stacking the gathered hay in a controlled build-up over the top surface of the platform.

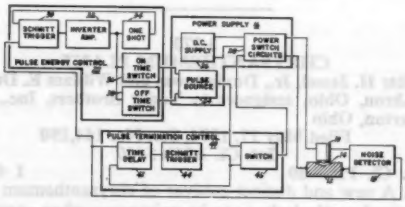
27,707
METHOD AND APPARATUS FOR DETECTING AND CONTROLLING THROUGH PULSE ENERGY VARIATIONS ARCING CONDITIONS IN AN EDM PROCESS

Harry D. Kauffman, Cincinnati, Ohio, by Cincinnati Milacron Inc., Cincinnati, Ohio, assignee

Original No. 3,642,337, dated Nov. 30, 1971, Ser. No. 95,296, Dec. 4, 1970. Application for reissue Aug. 11, 1972, Ser. No. 279,955

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 P 8 Claims



In an EDM process, a method and apparatus for controlling arcing conditions in a machining gap. An apparatus is provided for detecting the presence of a noise signal contained in a discharge. The absence of this noise signal is indicative of an arcing condition which may be detected during any one or a predetermined number of discharges. Upon detection of the absence of said noise signal, corrective action is taken in the power supply which is effective to alleviate the arcing condition.

27,708
BROAD-BAND COUPLED CAVITY SLOW-WAVE STRUCTURE

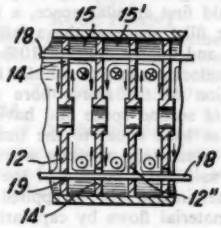
Tohru Matsuoka and Toshinori Horigome, Tokyo, Japan, assignors to Nippon Electric Co., Limited, Tokyo, Japan

Original No. 3,517,347, dated June 23, 1970, Ser. No. 693,775, Dec. 27, 1967. Application for reissue Dec. 22, 1971, Ser. No. 210,797

Claims priority, application Japan, Dec. 29, 1966, 42/986

Int. Cl. H03h *7/30*

U.S. Cl. 333—31 R 3 Claims



A broad band coupled cavity slow-wave structure of the backward wave type having a plurality of successively arranged cavities formed by separating partition walls in which a short-circuit conductor is provided along the longitudinal axis of the structure to short circuit the partition walls in sequence.

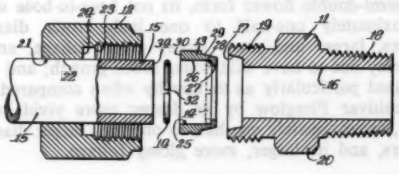
27,709
BRAZED SEAL CONNECTOR

Marvin E. Holmgren, Manitowoc, Wis., assignor to Imperial Eastman Corp., Chicago, Ill.

Original No. 3,201,154, dated Aug. 17, 1965, Ser. No. 72,381, Nov. 29, 1960. Application for reissue Feb. 11, 1972, Ser. No. 225,681

Int. Cl. F16l *13/02*

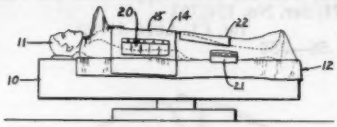
U.S. Cl. 285—286 6 Claims



1. A tube fitting comprising: a body having a bore therethrough defining at one end a recess having a frusto-conical, outwardly widening sealing surface; a nut having a straight bore for extension of a tube to be coupled therethrough including an outer portion, an inner, transversely enlarged portion, and an annular radial shoulder between said portions, said nut and body having co-operating threads for threading the nut to the body with said nut bore in coaxial alignment with said sealing surface; an annular sealing sleeve coaxially in said inner portion

of the nut bore, said sealing sleeve having a bore therethrough including a cylindrical outer portion for receiving the end of a tube to be connected, an inner transversely reduced portion, and an annular radial shoulder between said sleeve bore portions, the diameter of said outer portion of the sleeve bore being slightly larger than the outer diameter of the tube to be connected to define a radially thin first annular space therebetween, the diameter of said inner reduced portion of the sleeve bore being substantially larger than the internal diameter of the tube to be connected, said sleeve having a frusto-conical inner end having sealing engagement with said surface of the body recess and a portion provided with a radial outer face for engagement by the nut shoulder; and a ring of brazing material yieldingly retained in said outer portion of the sleeve bore adjacent said radial shoulder of the sleeve bore, the wire diameter of said ring being preselected to define a volume of said ring substantially equal to the sum of the volumes of said space, a second annular space axially outwardly of said radial shoulder of the sleeve having an axial length equal to the radial dimension of said first annular space, a first preselected concave annular fillet space at the axially outer end of said first space, and approximately 110% of the volume of a second preselected concave annular fillet space with said inner portion of the sleeve bore at the radially inner end of said second space and having a minimum inner diameter at least equal to the inner diameter of the tube to be connected, whereby when the tube end is inserted into said outer portion of the sleeve bore to abut the ring therein and heat is applied to liquify said ring, the ring material flows by capillarity to fill accurately said first annular space and allows the tube end to be moved into close juxtaposition with said radial shoulder of the sleeve to define said second annular space and said fillets, while precluding flow of the brazing material to within the bore of the tube to be connected.

27,710
NON-WOVEN SURGICAL SHIELD OR COVER MEMBER
Frederick J. Melges, 314 N. Orchard Place, Battle Creek, Mich. 49017
Original No. 3,503,391, dated Mar. 31, 1970, Ser. No. 616,128, Feb. 14, 1967. Application for reissue Aug. 2, 1971, Ser. No. 168,503
Int. Cl. A61f *13/00*
U.S. Cl. 128—132 D **10 Claims**



The non-woven surgical shield or cover member which carries improvements in the form of special reinforcement, adhesive anchoring means, multiple compartment instrument holding pocket members, supply carrying pockets, waterproofing, special construction of the surgical opening, and a rough surfaced reinforcing member near but spaced from surgical opening.

PLANT PATENTS

GRANTED JULY 24, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,370
AZALEA PLANT
Walter W. Knicely, Barberton, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed Mar. 26, 1971, Ser. No. 128,594
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of azalea characterized particularly as to novelty when compared to the cultivar Dorothy Gish by its more intense orange color, its single and semi-double flower form, its not hose-in-hose single, approximately one-half to one inch larger diameter flowers, larger and more glossy green foliage, and its tendency not to have wild water shoot growth; and characterized particularly as to novelty when compared with the cultivar Fireglow by its deeper more vivid orange color, approximately one-half to one inch larger diameter flowers, and its larger, more glossy foliage.

3,371
AZALEA PLANT
Stuart F. Henson, Fallbrook, Calif. (1053 Phillips St., Vista, Calif. 92083)
Filed Mar. 26, 1971, Ser. No. 128,595
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a tall, well branched plant with relatively stiff stems, freely borne flowers of Capsicum Red (reverse of petals Dutch Vermilion), long lasting flowers, thorny stems and foliage relatively mildew free.

3,372
CHRYSANTHEMUM PLANT
John L. Tomasovic, Sr., 1251 Meier Lane, St. Louis, Mo. 63131, and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio; assignors to said John L. Tomasovic, Sr.
Filed Apr. 6, 1971, Ser. No. 131,705
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of chrysanthemum characterized particularly as to its uniqueness compared to the white parent variety, Coronado, by its clear lemon-yellow color and its two to three inch less vigor.

3,373
CHRYSANTHEMUM PLANT
Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed May 17, 1971, Ser. No. 144,190
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—80 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Telstar by its more intense lavender flower color; a superior flower color retention, with the lavender color being darker and more attractive than parent when fading occurs; and by its longer period of

value, October to mid-June, as compared with mid-October through April of the parent cultivar.

3,374
ROSE PLANT
Herbert C. Brownell, Little Compton, R.I. 02837
Filed Dec. 15, 1971, Ser. No. 208,484
Int. Cl. A01h 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea type, substantially as herein shown and described, characterized particularly as to novelty by its vigorous habit of growth, abundant foliage, and its ability to withstand moderate sub-zero temperatures in combination with its hybrid tea character and its *Rosa wichuraiana* ancestry.

3,375
ROSE PLANT
Herbert C. Brownell, Little Compton, R.I. 02837
Filed Dec. 15, 1971, Ser. No. 208,485
Int. Cl. A01h 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea type, substantially as herein shown and described, characterized particularly as to novelty by its vigorous habit of growth, abundant foliage, its resistance to mildew and blackspot, and its ability to withstand moderate subzero temperatures in combination with its hybrid tea character and its *Rosa wichuraiana* ancestry.

3,376
AZALEA PLANT
Spencer R. Smith, Rockwood, Mich., assignor to Post Gardens, Inc., Rockwood, Mich.
Filed Jan. 24, 1972, Ser. No. 220,502
Int. Cl. A01h 5/00
U.S. Cl. Plt.—56 1 Claim

1. A new and distinct variety of azalea plant characterized particularly as to uniqueness when compared to the parent variety Chimes by its profuse branching and rapid growth; earliness and reliable ease of forcing, with a minimum of dormancy, and without requiring artificial precooling; by its flowers, which are profuse and which are more flat in shape than the bell shaped flower of the parent variety; slightly smaller but more abundant foliage, and by its buds which set and mature rapidly, from even late pinching; the variety being uniquely characterized from all known azalea varieties by the ease and reliability of being forced into early bloom for the Christmas market without requiring artificial precooling.

3,377
ROSE PLANT
Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to Carlton Rose Nurseries, Carlton, Oreg.
Filed Feb. 23, 1972, Ser. No. 228,780
Int. Cl. A01h 5/00
U.S. Cl. Plt.—24 1 Claim

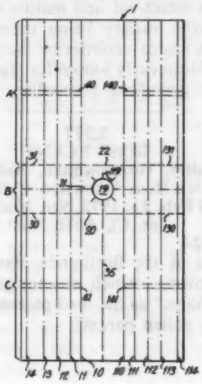
A rose plant of the floribunda class, particularly for greenhouse growing, which was originated by crossing "Dr. A. J. Verhage," as the seed parent, with an unnamed seedling as the pollen parent.

PATENTS

GRANTED JULY 24, 1973

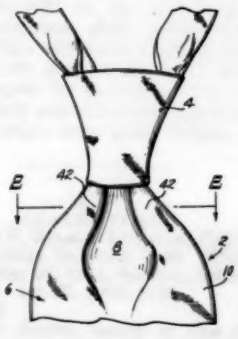
GENERAL AND MECHANICAL

3,747,122
DISPOSABLE GARMENT BAG CONSTRUCTION
Howard Zev Goldberg, 54 College Rd., Monsey, N.Y.
Continuation-in-part of Ser. No. 872,058, Oct. 29, 1969, Pat. No. 3,596,443. This application Aug. 2, 1971, Ser. No. 168,119
Int. Cl. A41d *13/10*
U.S. Cl. 2—48 **10 Claims**



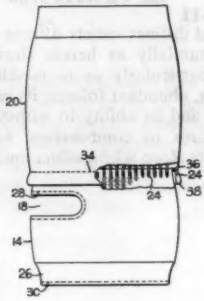
A disposable garment is made by repeatedly folding two parallel edges of a rectangular sheet of paper into pleats, providing a centrally located orifice as a collar, folding the sheet transversely to the pleats across the orifice and gluing the abutting edges of the innermost pleats one to another over a portion of their length not quite extending to the central fold. The unglued portion of the abutting edges serve as armholes when the resulting bag-like structure is pulled over the shoulders of a wearer.

3,747,123
SELF-DIMPLING TIE CONSTRUCTION
Samuel J. Miller, Baltimore, Md., assignor to Samuel J. Miller & Co., Baltimore, Md.
Filed Nov. 8, 1971, Ser. No. 196,455
Int. Cl. A41d *25/06*
U.S. Cl. 2—146 **5 Claims**



A four-in-hand necktie shell is provided with an interliner having two cutout portions spaced on either side of the centerline of the necktie in the region of the knot, the upper ends of the cutout portions tapering to a point at their upper, outer ends, and the interliner portion between the cutouts being sewn to the regular longitudinal seam of the shell. When a knot is tied in the necktie, the spaced and tapered cutouts cause a dimple to be formed in the drape portion of the necktie adjacent the knot.

3,747,124
CAP AND FACE HOOD
Donald Zientara, Greendale, Wis., assignor to Zwicker Knitting Mills, Appleton, Wis.
Filed Feb. 14, 1972, Ser. No. 226,152
Int. Cl. A42b *1/06*
U.S. Cl. 2—202 **2 Claims**



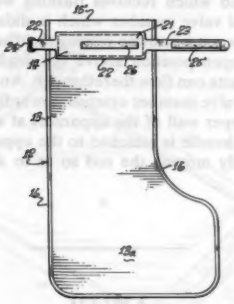
A knitted cap comprises a top cap portion and an integrally formed face hood portion which can be telescoped therewithin. The face hood portion comprises a lower end opening which is ribstitched and has an elastic band thereabout. The face hood portion also comprises a face opening which has an elastic band thereabout. The face hood portion has a band of ribstitching therearound above the face opening. The face hood portion is folded inwardly of the cap portion so that the band of ribstitching is within the lower part of the top cap portion. Elastic stitching through the band of ribstitching secures the face hood portion within the top cap portion.

3,747,125
CAST SHEATH WITH SEALING CLOSURE
Benjamin Goldman, 12238 Cantura St., Studio City, Calif., and Irwin J. Russakov, 6600 Whitaker Ave., Van Nuys, Calif.
Filed May 30, 1972, Ser. No. 257,758
Int. Cl. A41b *11/10*
U.S. Cl. 2—240 **2 Claims**

A waterproof sheath, comprised of a sock member and a closure member, for covering and protecting a plaster cast enclosing a broken limb.

The sock member is made of a flexible waterproof sheet material, such as vinyl plastic sheet, with an outer surface which is embossed, or otherwise formed, with a coarse grain. The closure member is comprised of an elongated panel of flexible material partially encircling the opening of the sock member, and welded to the sock member around the periphery of the panel. Strap members extend from each end of the panel, the first strap member having a buckle and a second strap member being designed to encircle the leg of the

user and pass through the buckle. The second strap member and the panel are provided with mating strips of fabric having

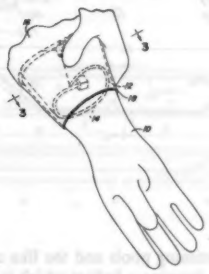


mutually engaging and locking surfaces, to permit the adjustable closure of the sock member by means of the closure member.

3,747,126
COLLAPSIBLE HERMETIC SEALING JOINT FOR GARMENTS

Earl J. Hoagland, Barrington, Ill., assignor to Standard Safety Equipment Co., Palatine, Ill.

Filed Aug. 31, 1971, Ser. No. 176,656
Int. Cl. A41d *27/10*
U.S. Cl. 2—270 **6 Claims**



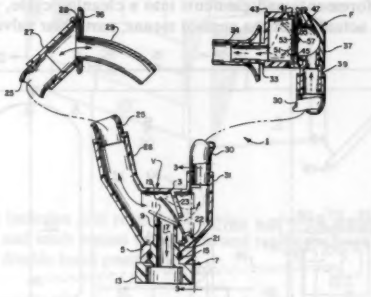
A sealing joint for garments including a glove having a tapered gauntlet which is stiffened against circumferential collapse and which may be received in an opening in a sleeve of lesser diameter than that of the gauntlet. The stiffener is adapted to be selectively collapsed to permit easy removal of the glove from the sleeve without necessarily taking off the garment.

3,747,127
VOICE PROSTHESIS

Stanley Taub, Brooklyn, N.Y., assignor to New York Medical College, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,179
Int. Cl. A61f *1/20*
U.S. Cl. 3—1.3 **18 Claims**

A voice prosthesis for vocal rehabilitation of laryngectomees and which includes an air bypass valve assembly having a valve body with a port communicating with the atmosphere for inhalation and exhalation of air. A tube is connected to the valve body and has an end adapted to be inserted in a tracheostomy opening in the human neck. A second tube is connected to the valve body with its end adapted to be inserted in a cervical esophageal fistula. The second tube has a check valve for preventing reflux of secretions from the esophagus into the valve body. The valve body includes a valve member which assumes a first position providing communication between the port and the opening during breathing at normal or stomal levels so that inhalation and exhalation normally are accomplished through this port. The valve member is movable in response to the increased breathing levels necessary for phonation into a second position in which the port is closed to the atmosphere so that air exhaled from the lungs at phonation levels is transmitted from the tracheostomy opening via these tubes and the esophageal fistula to flow over the esophageal mucosa in the area of the cricopharyngeus and provide a sound source that is articulated for speech.



3,747,128
GOLF CLUB HOLDER ATTACHMENT FOR PROSTHESIS

Joseph J. De Filipo, 11 Amsterdam Ave., Menands, N.Y.

Filed Feb. 18, 1972, Ser. No. 227,400
Int. Cl. A61f *1/06*
U.S. Cl. 3—12.8 **4 Claims**

An attachment for an arm prosthesis, adapted to hold the grip end of a golf club so that the amputee user can make a normal golf swing. The holder attachment includes a mounting base detachably connected to the prosthesis, and a clamping head connected to the mounting base by a connecting link portion providing both free rotary motion and pivotal motion in a single plane.

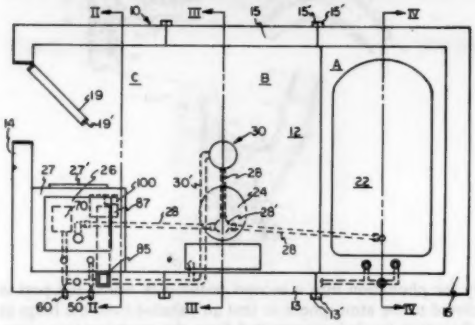
3,747,129
AUTOMATIC CLEANING SYSTEM FOR A HABITABLE ENCLOSURE

Dillard F. Dyar, Rt. 2, Abbeville, S.C.

Filed Sept. 9, 1971, Ser. No. 179,104
Int. Cl. A47k *17/00*
U.S. Cl. 4—1 **14 Claims**

A system is disclosed for automatically cleaning an enclosure such as a bathroom or the like. Sufficient spray nozzles

are disposed about the enclosure to ensure adequate spray coverage of same and are connected through the enclosure walls with a fluid supply line such as a water line. A cleaning solution supply, sanitizing solution supply or the like is associated with the fluid supply line to be discharged therein at the appropriate time. Likewise, a dryer means such as an air blower is disposed appropriately within the enclosure so as to assist in removing the fluid therefrom after cleaning. Further, a control means is provided that operatively associates all of the aforementioned elements into a cleaning cycle, whereby, upon actuation of the control means, particular valves are actuated to permit the flow of fluid to the spray nozzles for washing down the walls, floor and the like of the enclosure. At the appropriate time in the cycle, cleaning solution, sanitizers, or the like are discharged into the fluid supply line and carried with the fluid into the confines of the enclosure. Subsequent to cleaning, a rinse cycle is optionally included. After all washing steps are completed, the drying means is actuated as a part of the clean cycle to assist in removal of the cleaning solution from within the enclosure. Structures having the above described system incorporated therein are also claimed.

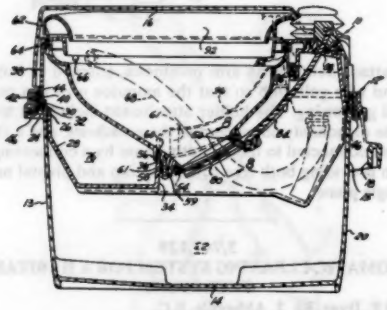


3,747,130

SELF CONTAINED FLUSH TOILET HAVING SLIDE VALVE

Frank T. Sargent, Nuneaton, Warwickshire, England, and James M. Andersen, Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Oct. 27, 1971, Ser. No. 193,060
Int. Cl. E03d *5/01, 5/012, 5/09*
U.S. Cl. 4—17 **10 Claims**



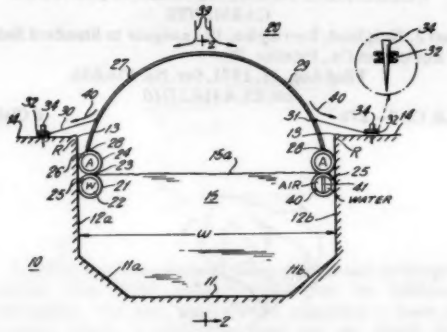
Portable toilet apparatus which comprises a plurality of molded plastic members that are configured and connected so as to form a fluid tight unit which is compact so that it can be readily carried from place to place. The unit consists of a waste holding tank, a flush water tank positioned on top of the waste holding tank, a bowl having an open lower discharge end positioned to discharge waste into the holding tank and an open upper end which receives flushing water, and an upwardly inclined valve member which is slidably mounted for movement between a position closing the discharge end of the bowl and an open position above the discharge end of the bowl so that waste can flow therethrough. An actuating rod attached to the valve member extends upwardly and rearwardly through the upper wall of the apparatus at a position behind the seat and a handle is attached to the upper end of the rod for conveniently moving the rod so as to actuate the valve member.

3,747,131

INFLATABLE SWIMMING POOL COVER

Peter Kollomichalis, 10 Parsons Rd., East Brunswick, N.J.

Filed Dec. 14, 1971, Ser. No. 207,927
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **6 Claims**



A cover for swimming pools and the like comprising a first continuous sleeve forming a ballast which is immersed in the pool around the perimeter thereof. A second continuous air-filled sleeve positioned immediately above the ballast limits the immersion level of the ballast. A sheet of plastic of suitable gauge is sealed to the air-filled sleeve and covers the pool. A valve is provided in the aforementioned flexible sheet for filling a hollow region defined by the sheet and the surface of the water with air. An apron provided around the perimeter of the sheet prevents the collection of water and/or debris. The apron may be anchored by a ballast sleeve and/or a plurality of stakes. As an alternative arrangement the first sleeve may be filled with both air and water in combination to serve the function of both the ballast and the buoyancy structures.

3,747,132

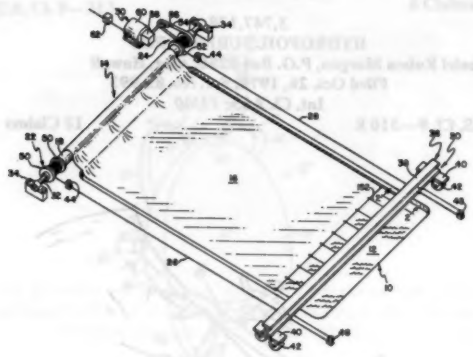
SWIMMING POOL COVER

Elton Gordon Foster, 147 Trinidad Dr., Tiburon, Calif.

Filed May 12, 1972, Ser. No. 252,580
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.14 **10 Claims**

A flexible pool cover is stored in rolled condition on a reel at one end of a swimming pool. Cables extend along the pool

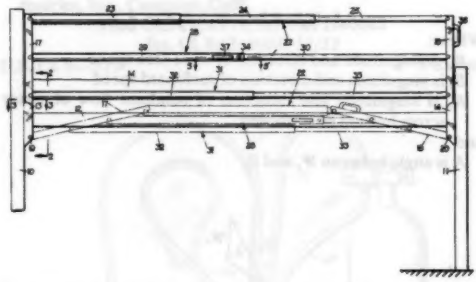
sides and over a reversing pulley for attachment to a trolley secured to the free cover end. The cable reels and cover reel are driven at the same rotational rate. Means are provided for



maintaining the cover and the cables free of substantial slack throughout reeling and unreeling movement.

3,747,133
COLLAPSIBLE SIDE RAIL ASSEMBLY FOR HOSPITAL BED

Clyde B. Hutt, 601 E. 22nd, Vancouver, Wash.
Filed Apr. 22, 1971, Ser. No. 136,349
Int. Cl. A47c *21/00*
U.S. Cl. 5—331 **3 Claims**

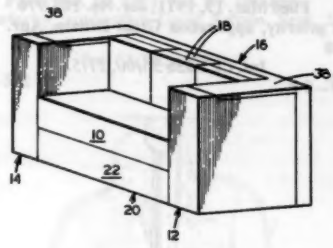


A side rail assembly comprising a pair of end members hingedly mounted at their bottom ends in brackets attached to the bed frame so as to swing from raised vertical position downwardly towards each other to collapsed position; composite telescoping horizontal rails extending between the end members; and locking means on one of the horizontal rails for holding it in extended position to maintain the end members in vertical position and the entire assembly in raised position.

3,747,134
CONVERTIBLE SOFA

Josef Montlague, 801 Falmouth St., Thousand Oaks, Calif.
Filed Feb. 11, 1972, Ser. No. 225,383
Int. Cl. A47c *13/18, 17/14*
U.S. Cl. 5—8 **10 Claims**

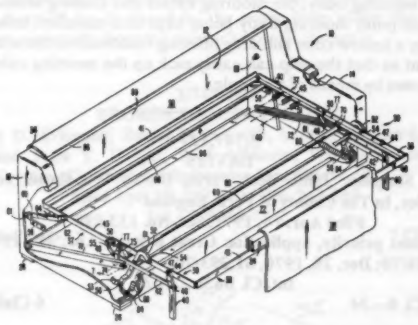
A conventional-appearing sofa having the customary sofa seat is provided with a back which is moveable from a substantially-vertical sofa-back position to an overhead horizontal position where it forms the upper bunk of a double bunk bed.



The sofa includes arm rests each having a pivoted, swingable link arm and latch means to position and retain the back in its elevated double bunk position.

3,747,135
CONVERTIBLE SOFA BED

Andrew A. Barabas, Danbury, Conn., assignor to Castro Convertible Corporation, New Hyde Park, N.Y.
Filed Feb. 28, 1972, Ser. No. 229,705
Int. Cl. A47c *17/14, 17/40*
U.S. Cl. 5—13 **10 Claims**

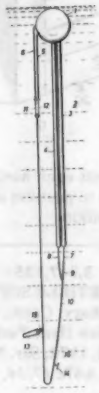


The sofa-bed is of the type in which the longest dimension of the mattress extends parallel to the back of the sofa-bed. A simple mattress support with only two hinged sections is provided. The back of the sofa frame has a forward facing cavity. A mechanism is provided for folding the mattress support and mattress into an L shape so that a substantially horizontal portion of the mattress forms a seat support, and a substantially vertical portion of the mattress forms a backrest for the sofa. Loose seat cushions and back cushions then are placed on the horizontal and vertical mattress portions to form an exceptionally soft seat and back for the sofa. A fabric flap is attached along the top of the sofa frame and covers the vertical mattress portion forming the sofa back rest. The flap is folded back over the back of the sofa when the bed is unfolded. The folding mechanism for the bed includes a leg linkage which remains below the upper surface of the mattress support so as to be out of the way of clothing and persons sleeping on the bed. A back swing-linkage is provided with a tie-bar which supports the rear section of the mattress support when it is horizontal, and also supports the same section when it is vertical for use as a back-rest.

3,747,136
SELF-MOORING OF A SHIP TO A ONE-POINT MOORING BUOY

Adam Macdonald, Bettyhill, by Thurso, Caithness, Scotland, assignor to Shell Oil Company, New York, N.Y.

Filed Mar. 19, 1971, Ser. No. 125,976
Claims priority, application Great Britain, Apr. 10, 1970, 17,158/70
Int. Cl. B63b *35/00, 21/52*
U.S. Cl. 9—8 P **4 Claims**

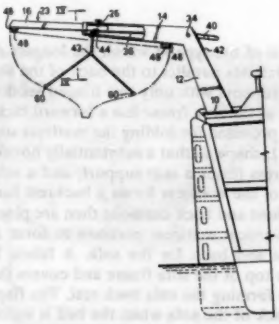


A method and apparatus for self-mooring a ship to a one-point mooring buoy, the mooring cables and floating hoses of the one-point mooring buoy being kept in a stretched condition by a hollow cone and drag offering resistance to the water current so that the ship can easily pick up the mooring cables and hoses by means of a grapple.

3,747,137
DAVITS

John Simpson, Jumb Beck Farm, Burley Woodhead, near Ilkley, In The County of York, England

Filed Apr. 14, 1971, Ser. No. 133,899
Claims priority, application Great Britain, Apr. 18, 1970, 18,638/70; Dec. 28, 1970, 61,393/70
Int. Cl. B63b *23/02*
U.S. Cl. 9—34 **6 Claims**



A davit for use on motor yachts and like craft has a part adapted to be fixed to the craft, a projecting limb, and an extending arm slidable relatively to the limb. A screwed member passes through a slot in either the limb or the arm and is secured in the arm or the limb as the case may be. The davit may be made of a hollow box structure, in which case a cable winch is mounted inside the davit. An elbow shaped tubular cable guide is also mounted in the davit.

3,747,138
HYDROFOIL SURFBOARDS

Daniel Ruben Morgan, P.O. Box 8286, Aiea, Hawaii

Filed Oct. 26, 1970, Ser. No. 83,993
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 E **12 Claims**

A wave riding, wave-propelled free body surfboard when underway along the surface of a wave is supported above the wave by hydrofoils having sufficient area, angle of attack and lift to support at least a portion of the surfboard above a surface of the water.

The force diagram shown below is a diagram coplanar with the wave surface.

$$R_s^2=W_s^2+B_s^2-2(W_s)(B_s)\cos A \quad 1.$$

Where:

W_s is magnitude and direction of wave face speed

B_s is magnitude and direction of surfboard speed

R_s is magnitude and direction of resultant flow of water across bottom of surfboard;

and

A is angle between W_s and B_s

$$\text{Area}=\text{Lift}/(\text{Speed}^2\times Cl\times p/2) \quad 2.$$

Where,

Area is total projected area of hydrofoils

Lift is combined weight of surfboard and rider

Speed is relative speed between surfboard and water

Cl is lift coefficient of given wing section at given angle of attack

and

p is the mass density of water

TABLE 1

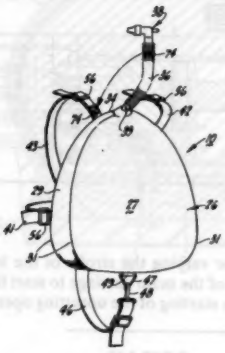
Wave height in feet	Average Maximum Speed in miles per hour	
	Conventional	Hydrofoil
10	20	25
20	25	30
30	28	35

3,747,139

BUOYANCY COMPENSATION

Edmund A. Braly, 756 Alto Vista Dr., Pacifica, Calif.

Filed Oct. 6, 1971, Ser. No. 186,973
Int. Cl. B63c *11/18, 9/08*
U.S. Cl. 9—313 6 Claims



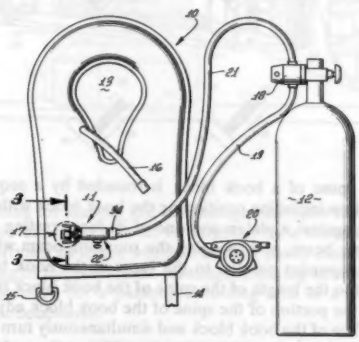
A buoyancy pillow for a free diver is attached to the ventral side of a diver's trunk by shoulder, waist and crotch straps, the pillow including a bladder with a center of buoyancy located in its lower one-half portion when inflated by the diver from a hose equipped with a mouthpiece having valve structure including a pressure-relief valve.

3,747,140

INFLATABLE VEST HAVING A QUICK-RELEASE HOSE CONNECTION TO SUPPLY TANK

Robert E. Roberts, Torrance, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.

Filed Oct. 12, 1971, Ser. No. 188,082
Int. Cl. B63c *9/08, 11/22*
U.S. Cl. 9—319 9 Claims



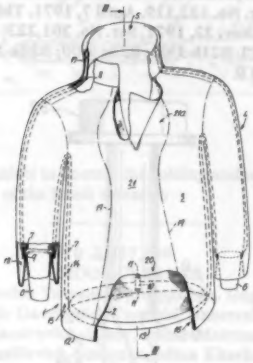
To facilitate inflation of an underwater safety vest, an air supply tank hose is provided with a valved, quick-release connector which mates with and is latched to a coupling on the vest. The coupling includes a check valve and a tubular projection received by a bore in the hose connector housing. A normally closed valve on the hose connector is actuated by depression of a handle to supply air for vest inflation. When the connector is unlatched, a bias spring urges the tubular projection out of the bore to insure quick disconnect of the assembly.

3,747,141

BUOYANCY GARMENT

Geoffrey William Crockford, Twyford, England, assignor to National Research Development Corporation, London, England

Filed Sept. 24, 1971, Ser. No. 183,564
Claims priority, application Great Britain, Sept. 25, 1970, 45,871/70
Int. Cl. B63c *9/08*
U.S. Cl. 9—341 4 Claims



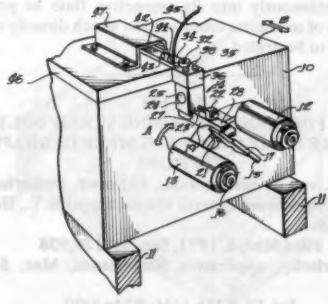
A buoyancy garment, e.g., a sailor's jacket, smock, or duck suit, containing pockets located so as to admit and retain air if the wearer falls into the water. Preferably the pockets catch air that will be displaced by the water from within the garment, especially from the wearer's normal clothes.

3,747,142

BROKEN TOOL DETECTOR

Ray D. Arbogast; Russel D. Neuroth, both of Rockford, Ill., and John T. Haight, Fort Atkinson, Wis., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Apr. 10, 1972, Ser. No. 242,580
Int. Cl. B21h *3/00*
U.S. Cl. 10—7 7 Claims



A broken tool detector utilized to check for the presence of any protrusion on the face of a tool, such as the second blow punch on a two blow header or similar machine, where the detector includes a probe which travels with the ram and is mounted on the ram on which the punches are mounted. The probe is positioned so that the second punch passes it as the punch is moved between its inactive and active punching positions. The probe is isolated electrically from the machine and wired to a low voltage circuit connected to the drive motor starter circuit by isolated detector relay contacts. Each time

the probe contacts the end of the punch, a capacitor charge is restored which supplies energy to maintain the detector relay contacts. If the punch is broken or worn and fails to make contact with the probe, the capacitor discharges and the detector relay drops out, stopping the machine.

3,747,143

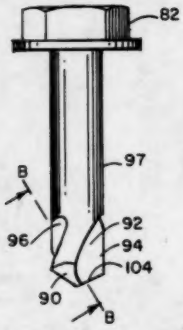
SCREW FORMATION

William A. Eager, Cornwall, N.Y., assignor to Star Expansion Industries Corporation, Mountainville, N.Y.

Division of Ser. No. 132,119, April 7, 1971. This application Nov. 22, 1971, Ser. No. 201,223

Int. Cl. B21h *3/02*; B23g *9/00*; B21k *1/56*

U.S. Cl. 10—10 R **5 Claims**



An elongate article comprising a shank which includes opposite end portions. One of the end portions constitutes a trailing end portion and the other a drilling or pilot end portion. The pilot end portion has a pair of laterally opposite grooves or flutes each gradually increasing in depth in a direction away from the trailing end portion. Each groove is defined by a pair of adjoining surfaces inclined relative to one another, one of which surfaces constitutes a cutting surface and the other a relief surface. Each cutting surface includes an endmost leading cutting edge portion of generally lateral extent longitudinally inclined relative thereto and extending continuously into the respective flutes. Each endmost leading cutting edge portion is generally symmetrically associated with the other and is inclined continuously into its respective flute to provide a cutting edge of minimum cross-section which directly contacts the material to be drilled.

3,747,144

MACHINE FOR MANUFACTURING SCREW BOLTS AND THE LIKE BY MEANS OF A NUMBER OF SHAPING STATIONS

Gerardus C. van de Meerendonk, Helmond, Netherlands, assignor to Nedschroef Octrooi Maatschappij N.V., Helmond, Netherlands

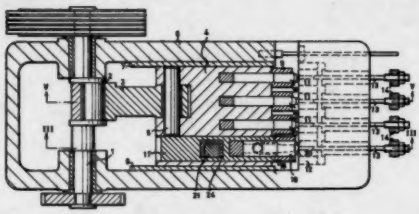
Filed Mar. 4, 1971, Ser. No. 120,938

Claims priority, application Netherlands, Mar. 5, 1970, 7003131

Int. Cl. B21k *1/44*; B23g *9/00*

U.S. Cl. 10—12 R **5 Claims**

The machine for manufactring bolts and the like as disclosed includes a frame, a number of shaping stations, more particularly for upsetting and trimming of blanks, said machine comprising a reciprocable main carriage mounted for reciprocation in the frame and carrying upsetting heads adapted to cooperate with dies mounted in a die plate fixed in the frame of the machine, a reciprocable trimming die adapted to cooperate with a trimming punch attached to the die plate, means for reciprocating the main carriage and trimming die to carry out a series of upsetting and trimming operations with respect to workpieces handled by the machine, the main carriage including means for effecting upsetting operations at each stroke and the trimming die effecting a trimming operation on an upset article at each working



stroke, and means for varying the stroke of the trimming die relative to the stroke of the main carriage to start the trimming operation prior to the starting of the upsetting operation.

3,747,145

METHOD OF AND APPAPATUS FOR ROUNDING THE SPINE OF A BOOK BLOCK

Klaus Heinrich Fomm, and Werner Barwicki, both of Leipzig, Germany, assignors to VEB Polygra-fischer Maschinenbau Leipzig, Leipzig, Germany

Filed Feb. 23, 1971, Ser. No. 117,906

Int. Cl. B42c *5/02*

U.S. Cl. 11—5 **2 Claims**

The spine of a book block is rounded by a sequence of operations including positioning the book block with its spine resting against a platen and one of its faces resting against a rounding beam, and swinging the rounding beam with a motion component parallel to the faces of the book block and normal to the length of the spine of the book block thereby to round the portion of the spine of the book block adjacent the other face of the book block and simultaneously turn the book block thereby to bring the other face against the surface of the platen.

3,747,146

FOOTWEAR CONSTRUCTION

Michael Mayer-Rieckh, Graz, Austria, assignor to Skischuhfabrik Dynafit GmbH, Graz, Austria

Filed July 26, 1971, Ser. No. 166,213

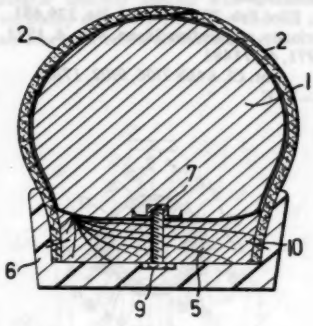
Claims priority, application Austria, July 24, 1970, 6799

Int. Cl. A43d *9/00*

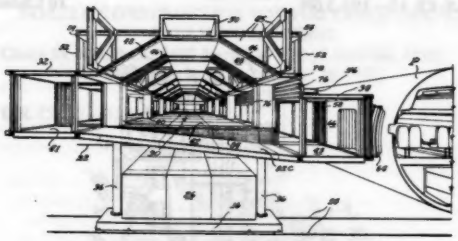
U.S. Cl. 12—142 R **3 Claims**

An elongated last is provided with a profiled underside and a reinforcing member for the article of footwear has an upper

side profiled in correspondence with the underside. The upper side of the reinforcing member is provided with bores extending through the reinforcing member. Releasable screw or bayonet connectors are extended through these bores and engage with cooperating connecting portions provided in the underside of the last.



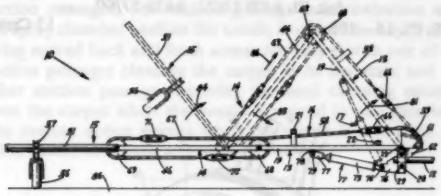
3,747,147
PASSENGER LOADING AND UNLOADING MACHINE
Harry M. Weese, 10 W. Hubbard St., Chicago, Ill.
Filed Dec. 30, 1968, Ser. No. 787,884
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **14 Claims**



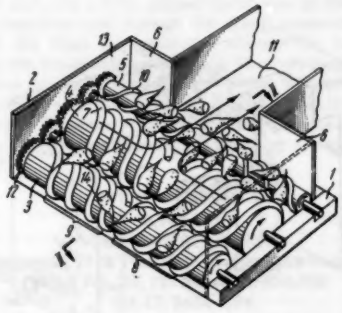
A machine for loading and unloading passengers from multiple doors on either side of an airplane by a movable passenger carrying structure which is at least partly cantilevered over a wing of the plane, said passenger carrying structure obviating the need for a passenger holding area in a terminal building or concourse.

3,747,148
FOLDING BOOM ASSEMBLY
Kenneth O. Hitchcock, Hitchcock Inc., Burlington, Colo.
Filed Aug. 24, 1971, Ser. No. 174,376
Int. Cl. F16h *21/44*
U.S. Cl. 74—101 **29 Claims**

A folding boom assembly having three articulately connected boom sections that are movable from a generally horizontal, aligned position to a generally upright, side-by-side position. The adjacent ends of the boom sections are pivotally connected together. A power transmitting mechanism having a first elongated flexible member connects the first boom section with the second boom section and a second elongated member connects the first boom section with the third boom section. A hydraulic motor operates with the power transmitting mechanism to control the folding and unfolding of the boom sections of the boom assembly.



3,747,149
ROOT CLEANER
Nikolai Vasilievich Tatyanko, prospekt Ju. Gagarina, 175, kv. 43; Alexandr Gavrilovich Tsymbal, Naberezhnaya, 9, kv. 4; Sergei Alexandrovich Isikov, ulitsa Matrosova, 8, kv. 49; Vladimir Vasilievich Stetsenko, ulitsa Kharkovskikh Divizy, 5, kv. 118; Ivan Pavlovich Oleinik, ulitsa Grigorovskaya, 86, kv. 58; Alexandr Samuilovich Betcher, ulitsa Bairona, 175, kv. 133; Leonid Georgievich Pasha, 605 mikroraion, 28, kv. 166; Genrikh Kariovich Ilge, ulitsa Bairona, 140a, kv. 22; Maria Stepanovna Sokolova, ulitsa Juzhnaya, 29, all of Kharkov; Ivan Ivanovich Rusanov, ulitsa Naberezhnaya, 17, kv. 28, Dnepropetrovsk; Jury Dmitrievich Gelmikh, ulitsa Koslora, 59, kv. 35, Dnepropetrovsk; Nikolai Dmitrievich Khmel, ulitsa Dnepropetrovskaya, 20-a, kv. 13, Dnepropetrovsk; Dmitry Ignatievich Kozhushko, ulitsa Fabrika, 82, kv. 14, Dnepropetrovsk, and Boris Anatolievich Beinisovich, ulitsa Shevchenko, 25, kv. 2, Dnepropetrovsk, all of U.S.S.R.
Filed Feb. 23, 1972, Ser. No. 228,702
Int. Cl. B07b *13/04*
U.S. Cl. 15—3.11 **3 Claims**



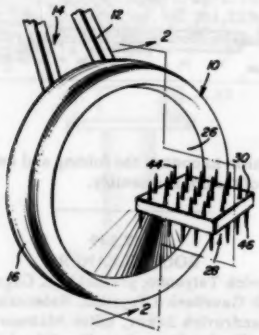
A root cleaner having several sections which consist of two drums, a roll and a shield. The drums are provided with helically arranged clustered webs on their outer surface. The helices of two adjacent web clusters are directed towards each other. The shield has a port located against the zone of the meeting of the web helix ends which serves to pass the roots and change the direction of their movement from axial movement lengthwise of the drums to radial movement over the drums and the roll.

3,747,150

GOLF CART HAVING SHOE CLEANING BRUSH ATTACHED TO WHEEL

Stanley S. Kozub, 6559 W. Maple Ave., R. D. No. 5, Geneva, Ohio

Filed Sept. 24, 1971, Ser. No. 183,368
Int. Cl. A47l 23/22; A63b 57/00
U.S. Cl. 15—105 12 Claims



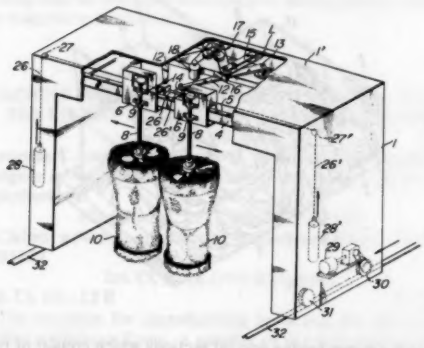
A double-sided brush construction including mounting structure for securing the brush to a golf cart wheel or the like with the brush disposed in a plane generally normal to the medial plane of the wheel and supported to one side of the latter for rotation therewith and with the axis of rotation of the wheel at least generally coinciding with the medial plane of the brush.

3,747,151

CAR WASHING APPARATUS

Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 3, 1972, Ser. No. 214,861
Int. Cl. B60s 3/06
U.S. Cl. 15—21 E 5 Claims



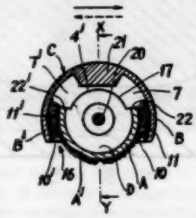
A car washing apparatus including a pair of vertically extending rotatable brushes which is mounted on a frame for transverse translational movement and for swinging movement in a longitudinal vertical plane, the transverse movement and the rotation of the brushes being started when the swinging movements of the brushes are detected.

3,747,152

CLEANING BRUSH WITH DUST REMOVING AND COLLECTING MEANS

Teruya Tsuruzawa, Suita, Japan, assignor to Nippon Seal Co., Ltd., Osaka, Japan

Filed Feb. 28, 1972, Ser. No. 229,691
Claims priority, application Japan, Mar. 4, 1971, 46/11503; Sept. 14, 1971, 46/71481
Int. Cl. A46b 7/06, 9/02, 17/06
U.S. Cl. 15—22 C 10 Claims



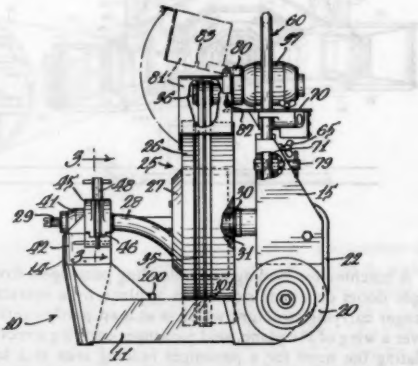
A cleaning brush includes a casing having a dust collecting compartment. An arcuate outer brush is fixed to the casing. An arcuate inner brush is movable with respect to said outer brush. Short bristles are implanted on the outer surface of the inner brush and lean toward the outer brush. Short bristles are also implanted on the inner surface of the outer brush and lean in the same direction as the bristles of the inner brush.

3,747,153

SEWER CLEANING MACHINE

Charles J. O'Neill, Mendota, Ill., assignor to Conco Inc., Mendota, Ill.

Filed May 1, 1972, Ser. No. 249,312
Int. Cl. B08b 9/02
U.S. Cl. 15—104.3 SN 10 Claims



A sewer cleaning machine having a driven cable drum and associated structure mounted for quick adjustment to permit removal and insertion of a cable drum by lateral rolling movement of a cable drum into and away from a mounting position in the frame of the sewer cleaning machine.

3,747,154

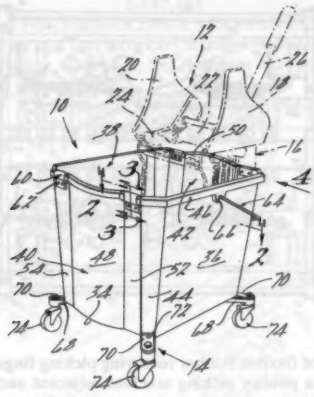
WRINGER BUCKET

Robert A. O'Neil, Wheaton, Ill., assignor to Geerpres Wringer, Inc., Muskegon, Mich.

Filed Oct. 15, 1971, Ser. No. 189,566
Int. Cl. A47j 47/19
U.S. Cl. 15—264 4 Claims

A molded monolithic bucket fabricated of a synthetic polymeric material and adapted for operative association with

a mop wringer apparatus having a frame, pressure applying means for extracting liquid from a mop and operating means for actuating the pressure applying means, the bucket comprising a generally horizontal extending bottom section and a pair of integral laterally spaced wall sections extending generally vertically upwardly from the bottom section, and forward and rearward end wall sections extending generally



laterally between the side wall sections, one of the wall sections being of a complementary shape with respect to the frame of the wringer apparatus and adapted for engagement therewith in a manner so as to prevent relative movement between the bucket and the wringer apparatus during use thereof.

3,747,155

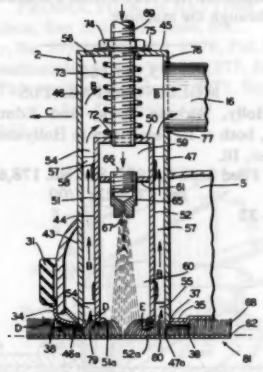
NOZZLE CONSTRUCTION FOR PORTABLE CARPET CLEANING MACHINE

Glenn M. Koellisch, 7482 Reno Dr. N.E., Louisville, Ohio

Filed July 9, 1971, Ser. No. 161,152

Int. Cl. A47l 7/00

U.S. Cl. 15—322 **5 Claims**



A nozzle construction for a carpet cleaning machine having an inner housing mounted within an outer housing, both of which are mounted on a movable base for movement across a carpet to be cleaned. The inner housing is formed with an upper fluid chamber and a lower spray chamber. The fluid chamber is connected with a source of cleaning solution which is sprayed into the spray chamber from a plurality of nozzles communictting with the fluid chamber and onto the carpet below. The outer housing has a suction chamber connected with a source of suction and includes suction passages formed on either side of the spray chamber. The inner housing has lips the lower edges of which are located spaced slightly above the level of the lower edges of the lips formed on the outer housing to provide communication between the spray chamber and suction passages. The suction passage communication with the spray chamber enables the nozzle to clean the carpet while being moved back and forth across the carpet with one of the suction passages cleaning the carpet in its dry state and the other suction passage removing the used cleaning solution from the carpet when the nozzle is moved in one direction. The reverse action occurs when the nozzle is moved in the other direction of back and forth movement.

3,747,156

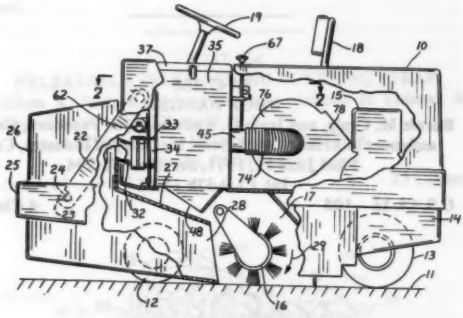
FILTER CHAMBER FOR SCRAPING MACHINE

Alfred D. Carlson, and Joseph G. Kasper, both of Minneapolis, Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 852,326, Aug. 22, 1969, Pat. No. 3,639,940. This application Nov. 4, 1971, Ser. No. 195,874

Int. Cl. A47l 9/10, 9/20

U.S. Cl. 15—349 **3 Claims**



A sweeping machine which has a surface maintenance tool, a debris receptacle for receiving material from the maintenance tool, and a filter compartment, and an airflow from the maintenance tool through the debris compartment and through the filter compartment, wherein the connection between the debris compartment and filter compartment comprises two tubular members, one of which is larger than and surrounds the other, and a diaphragm connection between the two tubular members to permit relative movement between the two tubular members without breaking the airflow connection.

3,747,157

CARPET STRETCHER

John Szymanski, 1728 Twelfth Ct. North, Lake Worth, Fla.

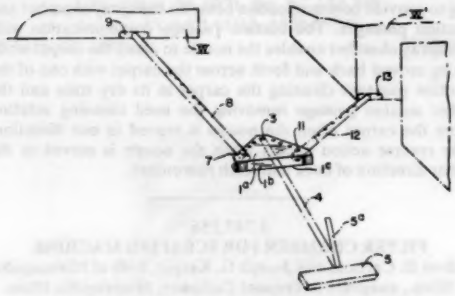
Filed Feb. 23, 1972, Ser. No. 228,488

Int. Cl. B65d 9/34

U.S. Cl. 16—5 **2 Claims**

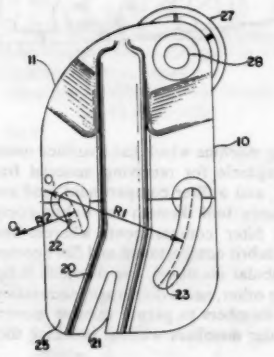
An adaptor includes a pair of spaced parallel triangular plates connected together adjacent the apex and sides of the base of the triangle. The plates have registering holes therein adjacent the corners of the apex and sides of the base to receive pivot pins respectively. The apex pin pivotally connects the inner end of a carpet stretcher head pole to the plates with the bases of the triangular plates disposed adjacent to the head, so that the said pole substantially bisects the plates. The remaining pivot pins pivotally connect the inner ends of a pair of extensible butt-plate carrying poles to the

plates at opposite sides of the carpet stretcher head pole respectively, whereby the adaptor will be prevented from



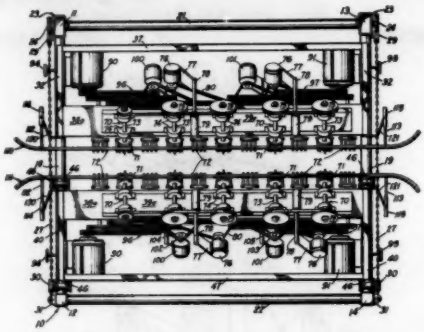
undue turning when stretching pressure is applied by the head against the butt-plates respectively.

3,747,158
DOOR HANGER
Burnie M. Craig, and Irvin O. Anderson, Jr., Pasadena, Calif., assignors to Arthur Cox & Sons, Inc., City of Industry, Calif.
Filed June 11, 1971, Ser. No. 152,294
Int. Cl. A47h 15/06
U.S. Cl. 16—105 **4 Claims**



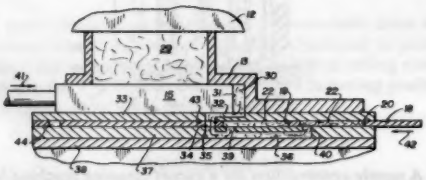
Disclosed is an improved hanger for suspended bypassing doors and particularly hangers designed for adjusting the height of a door mounted by such hangers. The improvements disclosed include an integral reinforcing rib running substantially the full length of the hanger and toward a corner opposite the wheel. Further improvement includes an adjustment mechanism comprising a pair of arcuate slots positioned on opposite sides of the reinforcing rib and having different centers, both centers positioned on the same side of the rib whereby location of the hanger about a mounting screw in each slot tends to produce frictional engagement between the side walls of the slots and the mounting screws. Maximum adjustability is achieved by the cooperation of the two arcuate slots and a large radius rounded corner of the hanger at the corner opposite the roller or wheel.

3,747,159
POULTRY PICKING MACHINE
Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.
Filed July 16, 1971, Ser. No. 163,341
Int. Cl. A22c 21/02
U.S. Cl. 17—11.1 **13 Claims**



Groups of flexible feather removing picking fingers are supported on a poultry picking machine adjacent each side of a predetermined path, with each group including a plurality of picking fingers operable for removing feathers from poultry or other fowl as they are conveyed therethrough along the predetermined path. The picking fingers of each group are supported on a number of rotatable support elements longitudinally spaced along the predetermined path in vertically spaced rows. The groups of picking fingers supported adjacent each side includes a top row of picking fingers rotatable about axes angularly disposed relative to the predetermined path and angularly disposed relative to a perpendicular axis, two intermediate rows of picking fingers rotatable about axes disposed substantially perpendicular to the predetermined path, and a bottom row of picking fingers rotatable about axes angularly disposed relative to the predetermined path and angularly disposed relative to the axes of the top and intermediate rows of picking fingers. The plurality of flexible feather removing picking fingers extend from opposing rotatable support elements into the path of travel of chicken or other fowl suspended headdown from a shackle and carried by a conveyor through the machine.

3,747,160
MOLDING APPARATUS
James A. Holly, Richton Park, and Edmund Schneider, Glenwood, both of Ill., assignors to Hollymatic Corporation, Park Forest, Ill.
Filed Sept. 8, 1971, Ser. No. 178,645
Int. Cl. A22c 7/00
U.S. Cl. 17—32 **24 Claims**



A molding apparatus for forming simultaneously a plurality of articles and specifically patties from a moldable material and specifically ground meat, fish or other edible material in which a movable mold having a plurality of mold openings is provided together with means for moving the mold longitu-

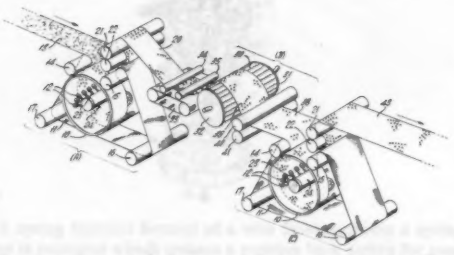
dinally between charging and discharging stations for the mold openings with one of a pair of the openings being located generally longitudinally forwardly of the other and a pressurized supply of the pressure flowable plastic and moldable material for supplying the material to the openings substantially simultaneously at the charging station.

3,747,161

METHOD FOR PRODUCING A REARRANGED FABRIC HAVING IMPROVED CROSS-STRENGTH

Frank Kalwaites, Gladstone, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 20, 1971, Ser. No. 173,442
Int. Cl. D04h *11/00*
U.S. Cl. 19—161 P **3 Claims**



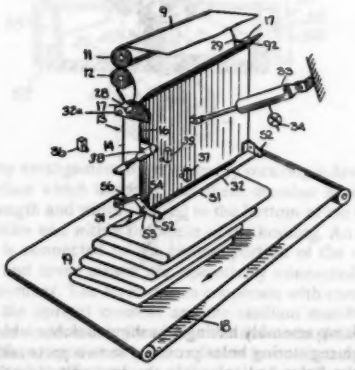
A method for producing, from a layer of fibrous material such as a fibrous web, nonwoven fabrics that contain apertures or holes or other areas of low fiber density and a pattern of groups of fiber segments defining such apertures, said fabric having improved cross strength. The method includes the steps of treating the fibrous layer by directing fluid rearranging forces against the layer while it is supported, stretching the treated layer in its transverse direction and treating the stretched layer with a plurality of fluid rearranging forces while the stretched layer is supported to produce a fabric having a pattern of fiber bundles defining a pattern of apertures or holes or other areas of low fiber density.

3,747,162

PRODUCTION OF BATTING

George A. Watson, Box 2245, Davidson, N.C.

Division of Ser. No. 37,416, May 13, 1970, Pat. No. 3,660,867, which is a continuation of Ser. No. 568,877, July 29, 1966, abandoned. This application Feb. 17, 1971, Ser. No. 116,046
Int. Cl. D04h *11/04*
U.S. Cl. 19—163 **4 Claims**



Apparatus for the manufacture of cross-lapped structures of fine webs of substantially parallel continuous filaments.

3,747,163

CLOSURE OR SEAL FOR DOORS, PACKAGES AND THE LIKE

Vincenzo Serino, Via Centuripe No. 34, 00174 Roma, Italy

Filed June 7, 1971, Ser. No. 150,369
Claims priority, application Italy, June 10, 1970, 51290 A/70
Int. Cl. B65d *55/06, 63/00*
U.S. Cl. 24—16 PB **1 Claim**

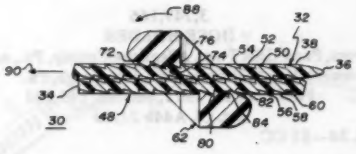
A device for locking or sealing doors or other closures or objects, said device consisting of a relatively lengthy strip of metal or other suitable material of substantially square cross sectional shape, said strip being provided at one end with a widened and flattened disk or head having an aperture through it and through which the body of the strip can be passed, said strip being capable of flattening under pressure to enable an enlarged head to be formed on a part of the strip after such part has been passed through the aperture in the head.

3,747,164

RELEASABLE SELF-LOCKING BUNDLING STRAP

William A. Fortsch, Livingston, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Nov. 1, 1972, Ser. No. 302,863
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **23 Claims**



A releasable self-locking bundling strap which is locked by the rotation of a head member in a first direction and released by the rotation of the head member in a second, opposite direction. The strap body portion is fabricated with oppositely oriented teeth on opposite planar surfaces of the body and of a width and thickness to permit both ends of the body portion to be placed through the aperture in the head member. Complementarily oriented teeth are placed on the top and bottom bounding surfaces of the head member aperture. In the released position the head member teeth do not engage the body portion teeth permitting free movement of the body portion. Rotation of the head member causes locking engagement between the head member teeth ahd body portion teeth. Various tooth combinations, head configurations, and ancillary structures are also described.

3,747,165

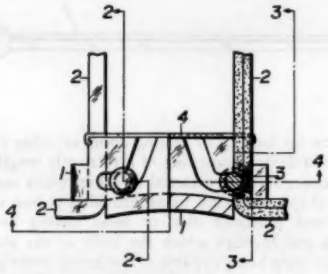
INSTANT EMERGENCY FAN BELT REPLACEMENT KIT

Roland Clough Brown, 425 Stratford Ct., Del Mar, Calif.

Filed June 9, 1972, Ser. No. 263,739
Int. Cl. F16g *7/06*
U.S. Cl. 24—31 F **2 Claims**

A fan belt kit for instant use in an emergency when a fan belt breaks on a motor vehicle or on industrial machinery. The kit consists of a double cinch buckle of soft metal, a spool of nylon-reinforced, heavy gauge, plastic friction belting, a

cutting instrument, instruction sheet and a gallon of water. It is usually stored in the trunk of the vehicle or in the maintenance room of a shop, factory or laboratory. The buckle and belting are sized to fit the pulleys in use. A single-edged razor blade performs well as the cutting instrument and occupies little space. A gallon of distilled water serves well as the coolant since it may also be drunk or used in the car battery if so needed. The double cinch buckle is fitted with a retainer cover



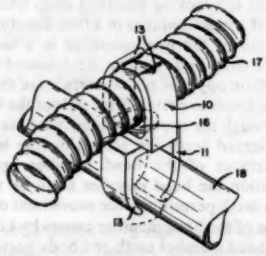
to confine the two spiral-ribbed rollers when placed in their slots at assembly. The belting is cut off at needed length, then threaded around the pulleys and the tag ends are threaded up through the slots in the bottom ends of the buckle, then the two tag ends are pulled outward with the hands to cinch up the belt snugly around the pulleys in a jiffy and your machine is ready to operate again. It's a cinch.

3,747,166

HOSE HOLDER

Bela Eross, Penn Hills Twp., Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.

Filed May 21, 1971, Ser. No. 145,801
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 CC **4 Claims**



The specification discloses a holder for hose or other flexible tubing. it comprises two essentially C-shaped elements placed back-to-back and having a swivel connection therebetween. The elements are made of molded plastic or other resilient material. on installation, one of the C-shaped elements may be sprung over a rod-like support to grip the rod and the hose or tubing may be inserted between and gripped by the legs of the other C-shaped element. The swivel connection permits freedom of movement of the hose relative to the support.

3,747,167

RAPID RELEASE BUCKLE FOR SAFETY BELTS AND HARNESS

Marcel H. Pravaz, Clichy, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Filed Nov. 23, 1971, Ser. No. 201,422
Claims priority, application France, Dec. 3, 1970, 7043450
Int. Cl. A44b *11/25, 17/00*
U.S. Cl. 24—205.17 **4 Claims**

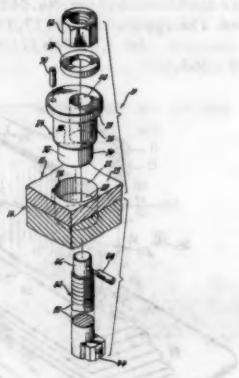
Rapid-release buckle for straps of a harness, for example of a parachute or other safety device. The buckle has locking members capable of releasing all the releasable harness straps when actuated by a first actuating device. A second actuating device is provided which enables only a selected number of the locking members to release a corresponding selected number of the releasable straps. The two actuating devices are compatible with each other.

3,747,168

CLAMP ASSEMBLY

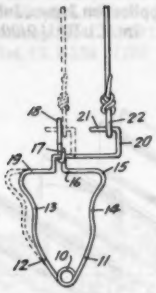
Bronius Snarskis, Brecksville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1971, Ser. No. 196,468
Int. Cl. A44b *17/00*
U.S. Cl. 24—221 R **2 Claims**



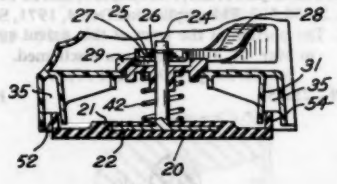
A clamp assembly having a bushing member which extends through registering holes provided in two parts and serves to align the holes and to secure the two parts together by the rotation of an eccentrically carried lock pin followed by the threading of a lock nut.

3,747,169
SPRING FASTENER
Lloyd E. Andersen, 3123 Upton Ave., N., Minneapolis, Minn., and Gilbert L. Alinder, 5312 Shoreview Ave., S., Minneapolis, Minn.
Filed Sept. 3, 1971, Ser. No. 177,623
Int. Cl. A44b *21/00*
U.S. Cl. 24—237 4 Claims



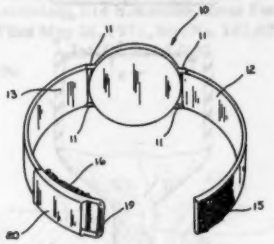
A spring fastener formed of a wire fashioned into a spring loop is provided which insures a positive lock action for connection of the fastener to an eyelet or a loop in a cord. The spring fastener has a two-hole eyelet construction on one arm thereof, with the second arm passing through and being guided by one of the eyes and then bending back upon itself to allow the free end to pass through the second eyelet when in the closed position.

3,747,170
CLAMP ARRANGEMENT
Raymond Kieves, Winnipeg, Manitoba, Canada, assignor to K-Tel International, Inc., Minneapolis, Minn.
Filed Nov. 10, 1971, Ser. No. 197,290
Int. Cl. A44b *13/02*; F16b *47/00*; A47b *91/00*
U.S. Cl. 24—263 B 4 Claims



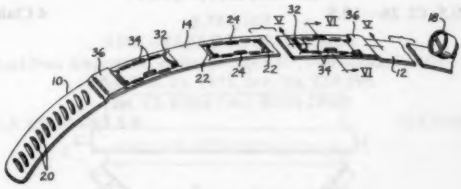
A clamp arrangement for detachably securing a device to a work surface which includes a resilient member having substantial length and width secured to the bottom of the housing of the device and within the limits of the housing. An upright member is connected to the central portion of the resilient member and lever means are operatively connected to the upright member. The lever means cooperate with cam means to move the upright member and the resilient member connected thereto to lockingly engage the deivce in place on the work surface upon movement of the lever means in one direction and to effect release of the device from the work surface upon movement of the lever means in an opposite direction.

3,747,171
CLASP FOR WATCHBANDS
Archer A. Montague, Jr., 1315 Baez St., Raleigh, N.C.
Filed Dec. 29, 1971, Ser. No. 213,272
Int. Cl. A44c *5/18*
U.S. Cl. 24—265 WS 4 Claims



In abstract, a preferred embodiment of this invention is a watchband composed of at least two parts, one of which has a surface with a plurality of resilient hook-like means and the second part having a surface of fibrous material so that the two parts can be joined with an infinite number of adjustments being possible within predetermined limits. Safety measures to prevent accidental release are also provided.

3,747,172
HOSE CLAMP
Harry J. Tarzian, R.D. 2, Box 245-D, Blairsville, Pa.
Filed Feb. 3, 1972, Ser. No. 223,137
Int. Cl. B65d *63/08*
U.S. Cl. 24—282 9 Claims

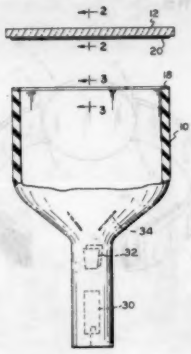


A hose clamp in which the band portion is made up in segments which can be interlocked to form the complete band. The segments have cooperating elements of a disengageable hook type connection means on the adjacent ends thereof and the terminal elements are formed with cooperating elements of an adjustable connector for drawing the band up about a hose to be clamped thereby.

3,747,173
METHOD OF SEALING CERAMIC TO NONMETALIC USING INDIUM ALLOY SEAL
Roger S. Lind, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Division of Ser. No. 866,688, Oct. 15, 1969, Pat. No. 3,632,008. This application July 28, 1971, Ser. No. 167,050
Int. Cl. C04b *37/00*
U.S. Cl. 29—25.13 14 Claims

A hermetic seal between a crystalline ceramic member and a member of inorganic, nonmetallic material, such as glass, ceramic or semiconductor material, is described which is formed by an alloy of indium and an active metal, such as titanium, zirconium, tantalum and hafnium. In one embodiment, an envelope for a cathode ray tube is formed by sealing

a glass faceplate to a ceramic funnel portion by the indium alloy seal. As a result of the short time required for such sealing, the cathode ray tube envelope may be first evacuated and



then sealed during the same heating cycle so that such evacuation can be performed through the large end of the envelope at such faceplate.

3,747,174

PROCESS AND APPARATUS FOR THE CONTINUOUSLY DENSIFYING NONWOVEN WEBS

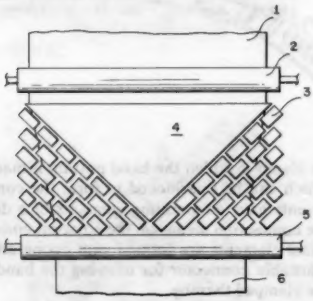
Herbert Porrmann, Konigshofen; Ludwig Klenk, Hallgarten, and Manfred Loffler, Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrick, Germany

Filed Sept. 14, 1970, Ser. No. 71,686

Claims priority, application Germany, Sept. 17, 1969, P 19 47 058.7

Int. Cl. D06c *7/00, 29/00*

U.S. Cl. 26—18.5 **4 Claims**



This invention relates to a process and apparatus for the production of a web of fiber fleece densified by heat shrinkage, which process comprises exposing the moving web to heat beginning simultaneously at opposite points on each edge of the web and continuing with time delay in the direction perpendicular to the web axis.

ERRATUM

For Class 29—25.13 see:
Patent No. 3,747,173

3,747,175

GASEOUS GLOW INDICATOR TUBE FORMED ON A SUBSTRATE WITH A PLURALITY OF INSULATING LAYERS

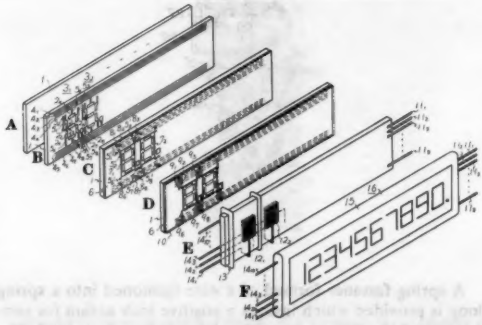
Saburo Uemura, Yokohama, and Yuzuru Yanagisawa, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 741,668, July 1, 1968, Pat. No. 3,588,571. This application Mar. 29, 1971, Ser. No. 128,888

Claims priority, application Japan, July 7, 1967, 42/43782

Int. Cl. H01j *9/00*

U.S. Cl. 29—25.17 **12 Claims**



A gaseous glow indicator tube including a method of manufacturing and aging in which the elements of the indicator electrodes are arranged in a single plane by plating conducting segments on a base insulating plate which also carries a plurality of element energizing electrodes. The various elements of the indicator elements are individually connected to the energizing electrodes. Anode electrodes are mounted adjacent the indicator electrodes and are connected to anode energizing leads so as to selectively energize various indications. A method for aging the gaseous glow indicator is also disclosed.

3,747,176

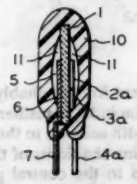
METHOD OF MANUFACTURING AN ENERGY TRAPPED TYPE CERAMIC FILTER

Isao Toyoshima, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kaiden, Nagaokakyo-shi, Kyoto, Japan

Continuation-in-part of Ser. No. 808,494, March 19, 1969, Pat. No. 3,650,003. This application Oct. 4, 1971, Ser. No. 186,215. The portion of the term of this patent subsequent to Mar. 21, 1989, has been disclaimed.

Int. Cl. B01j *17/00;* **H04r** *17/00*

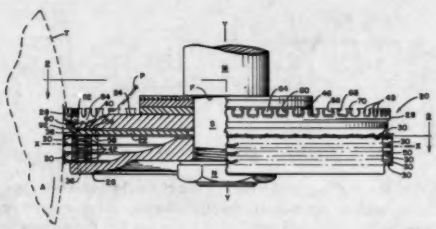
U.S. Cl. 29—25.35 **10 Claims**



Method of manufacturing an energy trapped type ceramic filter. The method comprises forming a thin layer of thermosublimating or thermo-evaporating material on and about the resonator electrode portions. Thereafter an insulative resinous outer layer is placed on the thin layer to cover all the portions.

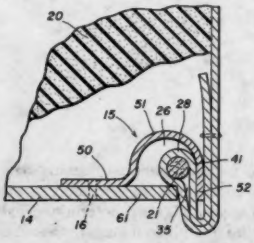
A gap or gaps between said resonator electrode and said outer layer is formed by heating the assembly for causing the thin layer to be sublimated or evaporated and to be absorbed into said outer layer.

3,747,177
TIRE PEELING DEVICE
Wayne Emil Jensen, P.O. Box 325, Homewood, Ill.
Division of Ser. No. 806,856, March 13, 1969, Pat. No. 3,618,187. This application Sept. 15, 1971, Ser. No. 180,624
Int. Cl. B23d 71/00
U.S. Cl. 29—78 R **9 Claims**



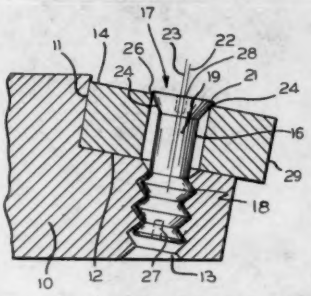
Tire peeling device having axially spaced rows of circumferentially spaced teeth about its periphery, the upper row comprising cutting teeth generally parallel to the axis on which the device rotates and having embossed and/or sharpened diverging side edges which with their outer edges peel the old rubber tread from a worn tire carcass as it is rotated there against on an axis generally perpendicular to the axis on which the device rotates. The other rows of teeth buff the peeled surface of the tire carcass to a texture for effective bonding of new rubber tread thereto. Both the buffing and cutting teeth constitute sheet metal segmented blades removably held between annular plates, the upper one having an annular concave surface which directs the peeled tread off the device to a receiving waste container.

3,747,178
METHOD FOR ATTACHING CUSHION TO RIGID BASE
Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.
Filed Feb. 14, 1972, Ser. No. 225,921
Int. Cl. B68g 7/00
U.S. Cl. 29—91.1 **6 Claims**



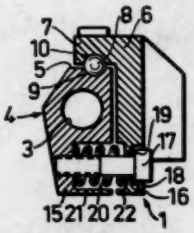
The method of manufacturing a cushioned support, such as a seat cushion having a fabric cover anchored to a rigid base member. The method includes inserting the seam portion at the peripheral edge of the fabric cover into a channel around the periphery of the rigid base member, and then inserting a thick welt inside said seam portion so that the welt can not be withdrawn from said channel.

3,747,179
TOOL HOLDER ARRANGEMENT
Norman H. Lovendahl, 814 N. Clinton, River Forest, Ill.
Filed May 26, 1971, Ser. No. 147,025
Int. Cl. B26d 1/00
U.S. Cl. 29—96 **7 Claims**



A clamp screw arrangement for securing an apertured cutting bit to a tool holder. The arrangement simultaneously clamps the bit against the bed and lateral shoulder means contiguous to the bed. Further, the arrangement applies holding pressure around the entire peirphery of the aperture in the tool bit to assure that the tool bit is not forced from the bed during cutting operations using the tool.

3,747,180
ADJUSTABLE TOOL HOLDER
Karl Ivan Andersson, Noltorpsvagen 3D, Mariestad, Sweden
Filed Feb. 23, 1972, Ser. No. 228,591
Int. Cl. B26d 1/00; B23b 29/00
U.S. Cl. 29—97.5 R **16 Claims**

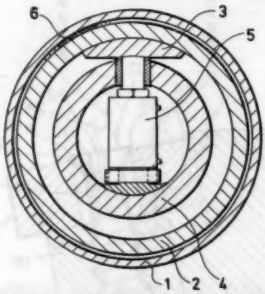


An adjustable tool holder, for use in a machine tool, such as a lathe, for holding a tool, such as a cutter, by means of which a workpiece is to be machined, comprises a body fixable on the machine tool and a bridge, adapted for the tool, such as the cutter to be secured thereto, said bridge (a) locating, at one end on one or more spherical elements which engage in the body and provide a swivel axis for the bridge, and (b) being connected at the other end to the body by an adjusting screw rotation of which adjusts the proximity of the bridge relative to the body by swinging it about the swivel axis, and therefore provides fine adjustment of the tool.

3,747,181
PRESS ROLL

Erik Albert Nykopp, and Leino Yrio Utriainen, both of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Jan. 18, 1972, Ser. No. 218,701
Claims priority, application Finland, Jan. 19, 1971, 125
Int. Cl. B21b *31/32*
U.S. Cl. 29—113 AD 5 Claims

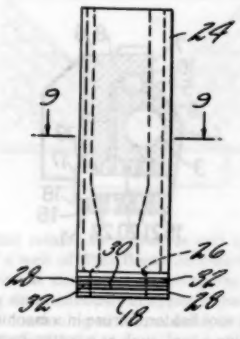


In a press roll, which has an outer rotating roll mantle and, fitted inside the mantle, a core, which works as the supporting and fixing axle and against which one or several pressure cylinders directed toward the press nip have been propped at one end, the rotating roll mantle has been attached with bearings onto the fixed supporting mantle surrounding the core and the other ends of the pressure cylinders arranged to actuate the supporting mantle.

3,747,182
METHOD OF FABRICATING A HOLLOW TURBINE BLADE HAVING AN INSERT THEREIN

Charles W. Hayes, East Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 35,361, May 7, 1970, Pat. No. 3,697,192.
This application Feb. 22, 1972, Ser. No. 227,838
Int. Cl. B23p *15/02*, *15/04*
U.S. Cl. 29—156.8 H 3 Claims

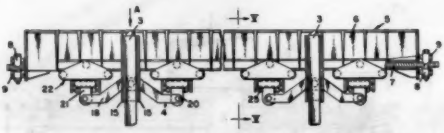


A hollow cooled gas turbine blade is made by forming an insert with a hollow airfoil and a hollow root portion and with lateral cooling air passages extending through the wall of the airfoil and positioning the insert in a hollow main blade having an airfoil portion and a notch in the root to receive the root portion of the insert with both root portions having aligned serrations on opposite surfaces for supporting the blade and the insert in a turbine disk.

3,747,183
BED FOR SHAPING SHEET STEEL PANELS HAVING SPATIAL CURVATURE

Artem Ivanovich Astapovich, ulitsa Mira, 17, kv. 24; Sergei Alexandrovich Bogoljubov, ulitsa Shkolnaya, 6, kv. 38; Nikolai Ivanovich Kuznetsov, ulitsa Frunze, 16, kv. 6; Oleg Dmitrievich Lupanov, prospekt Gaza, 17, kv. 23; Ivan Yakovlevich Pustovarin, ulitsa Blokhina, 25, kv. 4, and Tamara Alexeevna Fedorova, ulitsa Babushkina, 73, kv. 23, all of Leningrad, U.S.S.R.

Filed Nov. 12, 1969, Ser. No. 875,715
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P 4 Claims

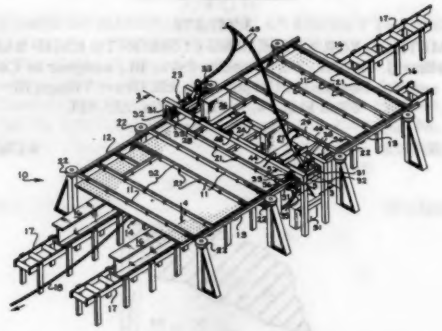


A bed for shaping and welding sheet steel panels having spatial curvature wherein horizontally movable beams carry vertically movable uprights serving as bearings for the sheets to be welded. The uprights are located on each beam in two parallel rows in which each upright of one row is positioned opposite to the corresponding upright of the other row. The oppositely positioned uprights are interconnected through a hinged device supporting a flexible flux trough adapted to assume the shape of the panels to be welded.

3,747,184
SYSTEM FOR FORMING BUILDING FRAME STRUCTURES

Herman F. Zaiss, 1569 Jasper Drive, Sunnyvale, Calif., and Ross J. Hagel, 1984 Downing Court, Santa Clara, Calif.

Filed Apr. 7, 1971, Ser. No. 131,917
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P 3 Claims



A system for forming building framing structures comprising means for carrying elongated stud members along, and disposed transversely of, a predetermined path, the opposite ends of the stud members being disposed and adapted to receive elongated channel-shaped structural plate members seated thereon at the opposite ends of the stud members. Means for guiding the plate members in a manner to positively maintain a precise, predetermined spacing therebetween have been provided as the plate members are carried along the path and means for permanently securing the plate and stud members together during their passage along the path.

3,747,185

APPARATUS FOR ASSEMBLING OR WORKING A WORKPIECE

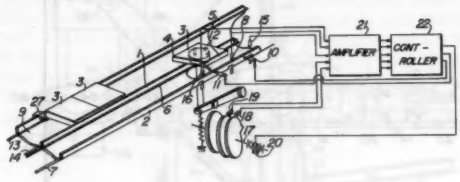
Hiroyoshi Samura, Tokyo; Mitsuyoshi Nagashima, Sayama, and Osamu Washimine, Higashiyamato, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1971, Ser. No. 209,831

Claims priority, application Japan, Dec. 28, 1970, 45/129431

Int. Cl. B23p *19/00, 21/00*

U.S. Cl. 29—200 A 3 Claims



A transfer machine comprising conveyor belt means for conveying a workpiece, a pair of guide rails for guiding the workpiece on the conveyor means, fluidic detecting means for detecting the workpiece so as to operate an escape mechanism for stopping the workpiece, lifting the workpiece from the conveyor belt means so that a desired working, machining, or assembling is performed, and thereafter lowering the workpiece onto the conveyor means.

3,747,186

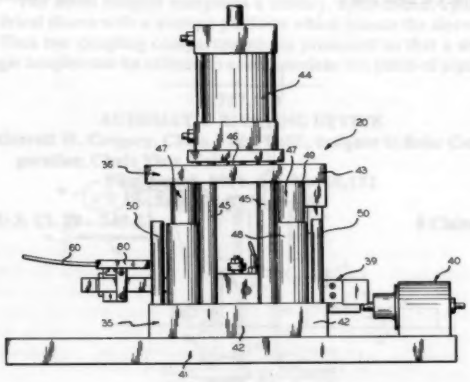
MACHINE FOR MAKING WIRE TERMINALS AND APPLYING SAME TO A BOBBIN

Joseph J. Cervenka, Elmhurst, and Marvin E. Hetzel, Riverside, both of Ill., assignors to Cerzei Tool & Engineering Company, Broadview, Ill.

Filed Oct. 12, 1971, Ser. No. 188,085

Int. Cl. H05k *13/00*

U.S. Cl. 29—203 D 11 Claims



A machine for cutting wire into terminals and applying same to a plastic bobbin which includes means for incrementally and guidably feeding wire to a cutter where the wire is cut into terminal lengths, a bobbin holder adjacent the cutter having terminal holes aligned with the terminals after they have been cut from the wire, means for holding the terminals in aligned relation with the holes of the bobbin and against a backing member, means for connecting the bobbin holder to the feeder so that upon the return stroke of the feeder the terminals are inserted into the bobbin holes, and means for assisting the feeding of the terminals in the bobbin.

3,747,187

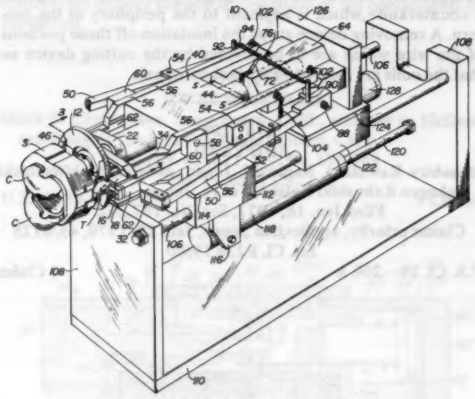
WIRE HANDLING METHOD AND APPARATUS WITH MULTIPLE FUNCTION CAM ACTUATOR

William C. Colwell, Springfield, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Dec. 20, 1971, Ser. No. 209,565

Int. Cl. H01r *43/04, 43/00*

U.S. Cl. 29—203 D 10 Claims



A method and apparatus for temporarily securing stator coil lead wires to terminal clips mounted on a stator core wherein the lead wires are positioned in alignment with the terminal clips, tamped into the clips and then crimped by the ends of the clips. The wire positioning, tamping and terminal crimping functions are accomplished by rotatably and pivotally mounted arm members supported on a common mount and rotated or pivoted by linear movement of a multiple function cam actuator having plural cam surfaces.

3,747,188

APPARATUS FOR MAKING COILS FOR ARMATURES OF ELECTRICAL MACHINES OR THE LIKE

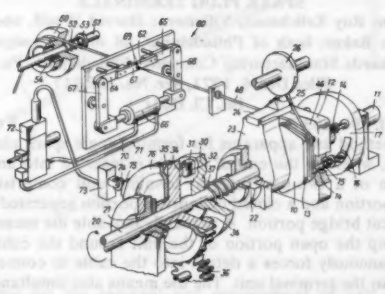
Reinhard Boke; Alfred Schmid, and Heinz Wilke, all of Hildesheim, Germany, assignors to Bosch, Robert, GmbH., Stuttgart, Germany

Division of Ser. No. 828,145, May 27, 1969, Pat. No. 3,643,326. This application Nov. 2, 1971, Ser. No. 194,824

Claims priority, application Germany, May 29, 1968, P 17 63 434.3

Int. Cl. H02k *15/00*

U.S. Cl. 29—205 C 10 Claims



Armature coils for use in electrical machines are proeuced on a revolving pattern of polygonal outline. A continuous length of wire having a current conducting core surrounded by

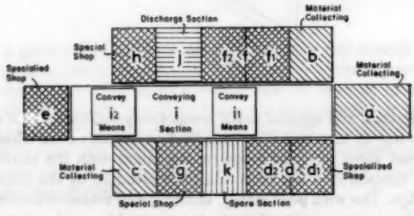
an insulating sheath is fed nder tension to the peripheral surface of the revolving pattern. A set of pushers cooperate with the pattern to move successively formed convolutions axially of the pattern. A cutting device which severs the wire between selected convolutions to form a succession of coils comprises a finger which orbits about the pattern and a reciprocating device which moves the finger axially at predetermined intervals so that the finger loops the wire between selected convolutions and moves the thus engaged part of the wire against a counterknife which is adjacent to the periphery of the pattern. A removing device strips the insulation off those portions of the wire which are to be severed by the cutting device so that the coils are formed with blank terminals.

3,747,189

SHIPYARD

Masahiro Kawasaki, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1971, Ser. No. 107,262
Claims priority, application Japan, Jan. 23, 1970, 45/6125
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 A **1 Claim**



A shipyard for constructing a work unit or units to be completed by a combination of a plurality of process steps, comprising a strip of conveying section which is equipped with conveying equipment, and specialized shop sections for performing the individual process steps having sufficiently wide entrances on the sides facing said strip of conveying section through which the conveying equipment and/or a work unit or units can enter or leave the individual shop sections, said specialized shop sections being so located as to surround said conveying section.

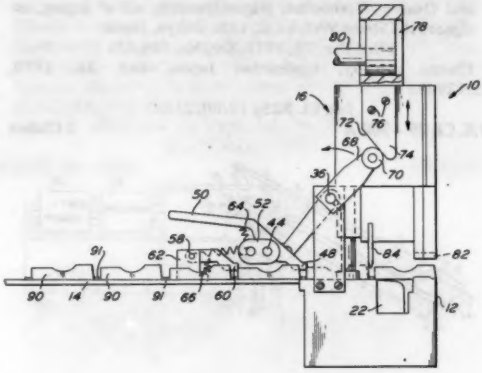
3,747,190

METHOD AND APPARATUS FOR MAKING ANGLE SPARK PLUG TERMINALS

Stanton Roy Erlichman, Villanova; Harold Woolf, and Norman Baker, both of Philadelphia, all of Pa., assignors to Richards Manufacturing Company, Philadelphia, Pa.

Filed Dec. 6, 1971, Ser. No. 205,117
Int. Cl. H01r
U.S. Cl. 29—203 D **5 Claims**

A method and apparatus for forming angle spark plug terminals, whereby the end of a cable is inserted into an open portion of a two-part integral terminal unit comprising an open portion and a closed cylindrical portion separated by an undercut bridge portion. A vertically movable die means acts to crimp the open portion of the unit around the cable and simultaneously forces a detent into the cable to connect the cable to the terminal unit. The die means also simultaneously effects a bending of the closed portion around the bridge portion into a predetermined angle relative to the remainder of the assembly. The terminal units are initially formed in a strip with connecting means therebetween in order to provide effective linear feed movement of the terminal units. Simultaneously with the coupling, crimping and bending of each assembly, the next preceding assembly is severed therefrom,



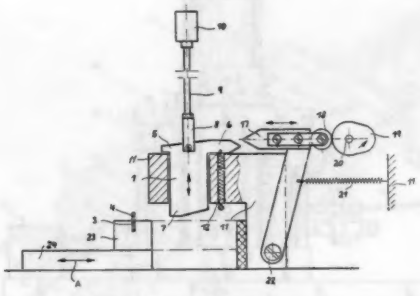
through the connecting means, by the same movement of the die means.

3,747,191

APPARATUS FOR PLACING OF CONTROL PINS, OR BREAKING OFF OF CONTROL BUTTS OF CONTROL ELEMENTS IN JACQUARD SELECTORS FOR TEXTILE MACHINERY

Falk Kuhn, Kiebingen; Josef Fink, Rangendingen; Gunter Maier, Rottenburg, and Pius Kohler, Wurmlingen, all of Germany, assignors to Fouquet-Werk Franz & Planck, Rottenburg, Germany

Filed Mar. 22, 1972, Ser. No. 236,897
Claims priority, application Germany, Mar. 25, 1971, P 21 14 385.1
Int. Cl. B23p *19/04*; B23q *7/10*
U.S. Cl. 29—208 C **12 Claims**



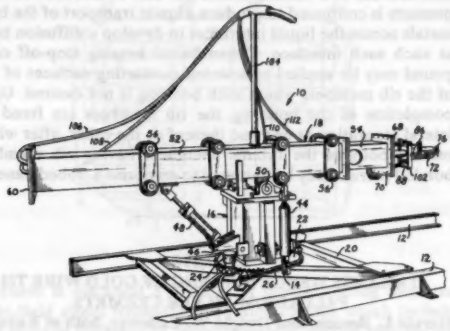
A holder is adapted to hold either control jacks, or a control wheel into which pins are to be inserted. Located in alignment with the holder is a tool head assembly having a plurality of tool heads which can be, selectively, placed in interfering, or non-interfering position with respect to the carrier for the control jack or wheel. Upon feed movement of the carrier, butts on the jacks will be broken off at those points where tool heads are located in interfering positions; or, pins fed from a magazine are pushed into a pattern wheel or cylinder, where the tool heads, upon relative movement, are in interfering position. The selection of placement of the tool heads is automatically controlled, for example, from an electronic input device, optical reader, or the like.

3,747,192

HANDLING APPARATUS FOR COUPLINGS USED IN APPLICATION OF PIPE COATINGS

Robert J. Harris, and Gail T. Sikes, both of Marrero, La., assignors to Price, H. C., Co., Bartlesville, Okla.

Filed May 21, 1971, Ser. No. 145,750
Int. Cl. B23p 19/02
U.S. Cl. 29—237 5 Claims



A method and apparatus for removing a novel type of coupler from a coated joint of pipe. The coupler joins two pipes together during a coating operation and also protects the ends of the pipe from application of the coating. The coupler puller utilizes an elongated telescoping arm having clamp structure at one end for grasping the coupler and then pulling it relative to the joint of pipe. The arm is mounted for rotation about a horizontal axis and, when necessary, the arm can be reciprocated in a vertical plane to fracture the coating and thus loosen the coupler. The arm is also mounted for rotation in a horizontal plane so that once the coupler is removed from the pipe the arm can be swung through an arc of 180° to deposit the coupler at a point removed from the area of the coated pipe.

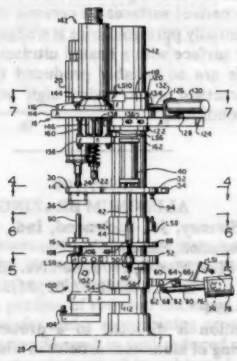
The novel coupler comprises a unitary, open-ended, cylindrical sleeve with a webbed partition which bisects the sleeve. Thus two coupling compartments are presented so that a single coupler can be utilized to accommodate two joints of pipe.

3,747,193

AUTOMATIC RIVETING DEVICE

Gerrett W. Gregory, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed June 9, 1970, Ser. No. 45,171
Int. Cl. B23p 11/00
U.S. Cl. 29—243.53 8 Claims



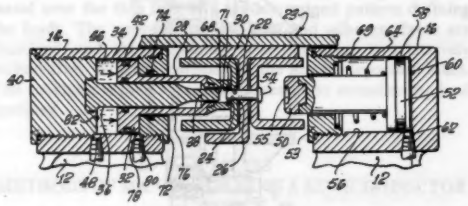
An upper pressure foot assembly is fixed to an upright column and mounts rams connected to a lower pressure foot assembly slidable on the column for clamping a workpiece therebetween. A ram operated support, mounted for swinging about the column axis, carries ram operated drilling and rivet holding means for perforating the workpieces and inserting and holding a rivet in the perforation. The lower pressure foot assembly has column gripping means and rivet squeezing means, ram operated in the order named. A system of switches, relays, solenoids and air valves provide interlocking controls for orderly sequential operation of the components of the device.

3,747,194

RIVET SQUEEZER

Mark S. Christensen, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Oct. 4, 1971, Ser. No. 186,048
Int. Cl. B21j 15/22
U.S. Cl. 29—243.54 7 Claims



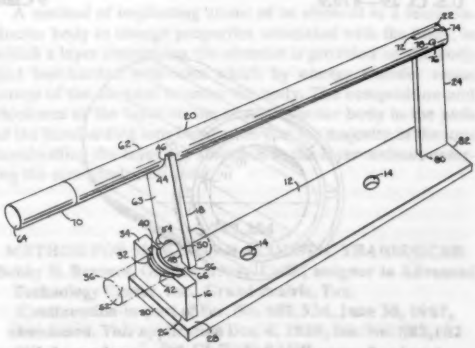
A tool to preload and upset rivets being installed in structure including a preload piston with a connected preload sleeve to establish a predetermined preload between the structure and the rivet, an anvil, and a squeeze piston with a connected head set for upsetting the rivet against the anvil once the preload has been established.

3,747,195

TOOL FOR REMOVAL AND REPLACEMENT OF HALF MOON SHAFT LOCKS

Thayer B. Rigsby, 3405 Camelia Pl., Largo, Fla., and Burl K. Rigsby, 110 Stillwood Dr., Manchester, Tenn.

Filed Mar. 20, 1972, Ser. No. 236,398
Int. Cl. B23p 19/04
U.S. Cl. 29—267 3 Claims



A tool for the removal and replacement of half moon shaped shaft locks consisting of a stationary anvil having an upper semicircular surface and a semi-circular groove therein and a cooperating die having a lower semi-circular surface. The die is supported by a handle which is pivoted at one end to cause the operating surface of the die to move in an arc which passes close to the working surface of the anvil whereby the

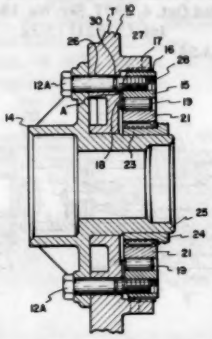
die may be operated to remove a shaft lock on a shaft cradled in the anvil and, alternately, to cause a shaft lock to be forced on a shaft when the shaft lock is initially placed in the groove of the anvil and in engagement with a shaft groove and the handle operated to apply force to the shaft and thus cause the shaft to be forced downward against the shaft lock and in place in the groove in the shaft.

3,747,196

AUTOMATIC TRANSMISSION REVISION AND METHOD

Pat K. Whittington, 540 N. Utah Ave., Idaho Falls, Idaho

Filed Aug. 25, 1971, Ser. No. 174,668
Int. Cl. B22d *19/10*; B23p *7/00*, *19/00*
U.S. Cl. 29—401 **1 Claim**



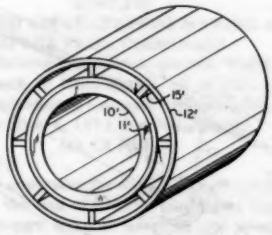
An automotive automatic transmission revised structure wherein the outer sprag race of the transmission is positively secured to the rear transmission bell, to correct for prior inadvertent stripping or wearing down of engagement splines proximate this transmission area. The subject revision requires minimal expense and obviates the necessity of replacement of expensive parts.

3,747,197

METHOD OF MAKING A RIBBED PANEL

Frank J. Riel, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 9, 1971, Ser. No. 197,018
Int. Cl. B23k *1/20*
U.S. Cl. 29—470.9 **9 Claims**



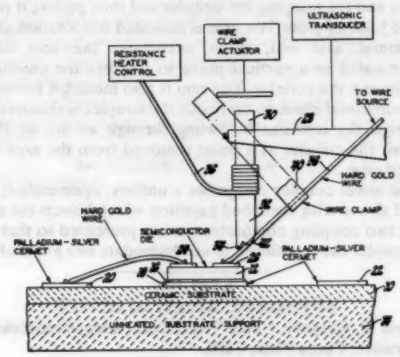
A pair of generally tubular titanium members of different diameter are mounted, one within the other and in radially spaced relation to each other, with the inner one fitted around a mandrel having a greater coefficient of thermal expansion than at least the outermost of the two tubular members. A multiplicity of rib members are fitted, spoke-like between the inner and outer tubular members with at least one radially directed surface of each of a selected plurality of the rib members plated with successive layers of selectively applied plating metals. The two tubular members, at least on the surface portions thereof which contact plated surfaces of the rib members, are chemically clean, so that upon heating the assembled parts to a temperature sufficient to liquify the plating metals, the mandrel causes, and thereby expands the inner tubular member to expand at a rate greater than the outer tubular member sufficiently to place the rib members in compression between the two tubular members. The combined heat and pressure is continued to produce atomic transport of the basis metals across the liquid interfaces to develop a diffusion bond at each such interface. Conventional brazing stop-off compound may be applied to selected contacting surfaces of any of the rib members where such bonding is not desired. Upon completion of the bonding, the rib members are freed for lateral separation at one end thereof or the other, after which one or both of the tubular members having rib members bonded thereto may be flattened to comprise a ribbed panel.

3,747,198

TAILLESS WEDGE BONDING OF GOLD WIRE TO PALLADIUM-SILVER CERMETS

Harold L. Benson, and Dwight W. Callaway, both of Kokomo, Ind., assignors to General Electric Corporation, Detroit, Mich.

Filed Aug. 19, 1971, Ser. No. 173,020
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 **4 Claims**



A technique for making tailless wire bonds directly to palladium-silver cermet surfaces on ceramic substrates. Hard-as-drawn substantially pure gold wire is wedge bonded to the palladium-silver surface with a heated ultrasonic bonding wedge. Strong bonds are so reliably produced that automatic tail pulling is practical even under high volume commercial production conditions.

3,747,199

ALUMINUM BRAZING

O. William Swaney, Jr., Richmond, Ind., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Mar. 9, 1972, Ser. No. 233,283
Int. Cl. B23k *31/02*, *35/38*
U.S. Cl. 29—494 **4 Claims**

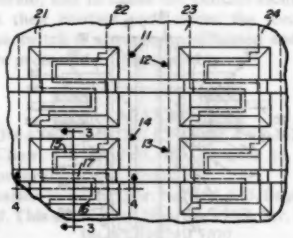
This invention is directed to a process for the fluxless vacuum brazing of aluminum articles in which successful brazing is accomplished without the necessity for complete degreasing which has heretofor been considered absolutely necessary.

3,747,200

INTEGRATED CIRCUIT FABRICATION METHOD

James L. Rutledge, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 31, 1972, Ser. No. 239,935
Int. Cl. B01j 17/00
U.S. Cl. 29—571 4 Claims



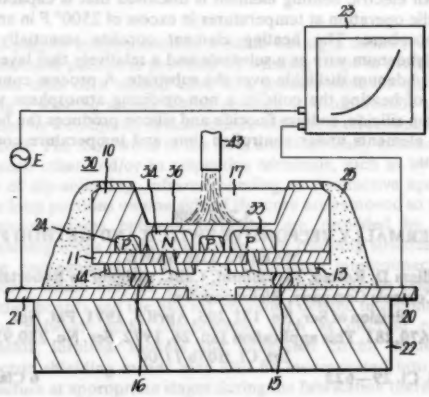
There is disclosed a method of manufacturing insulated-gate field effect transistor integrated circuits which includes the steps of diffusing an interconnection pattern into the surface of a semiconductor wafer prior to the formation of the insulated-gate field effect transistor devices. The insulated-gate field effect transistor devices are formed by utilizing the gate as a mask for the source and drain diffusion so that the device is self-aligned.

3,747,201

MAGNETORESISTANCE ELEMENT AND METHOD OF MAKING THE SAME

Michio Arai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 20, 1970, Ser. No. 56,444
Claims priority, application Japan, July 22, 1969, 44/57819
Int. Cl. H01l 5/00, 7/50, 9/10
U.S. Cl. 29—574 5 Claims



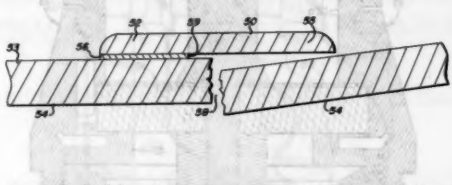
A magnetoresistance element comprising a semiconductor wafer having a high resistivity and having a pair of junctions formed on one surface of the wafer which are capable of injecting carriers, a portion of reduced thickness formed on the other side of the wafer and a recombining area having a high rate of recombination formed in said reduced cross-sectional portion such that the element when subjected to a magnetic field exhibits a non-linear response. The method of making the element on the semiconductor wafer is also included.

3,747,202

METHOD OF MAKING BEAM LEADS ON SUBSTRATES

John Robert Jordan, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Nov. 22, 1971, Ser. No. 200,873
Int. Cl. B01j 17/00
U.S. Cl. 29—577 12 Claims



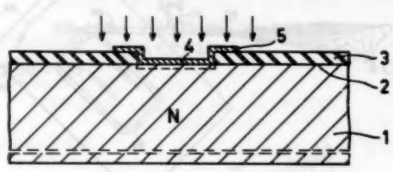
A method of forming beam leads on substrates by depositing a thin film of metal over an adherent layer of conductive material on the substrate, and electrodepositing additional metal over the thin film in a predetermined pattern defining the leads. The unprotected thin film and adherent layer are dissolved and the remaining adherent layer is selectively etched from beneath portions of the electrodeposited leads. The substrate is then separated beneath the nonadhering lead portions.

3,747,203

METHODS OF MANUFACTURING A SEMICONDUCTOR DEVICE

John Martin Shannon, Ossining, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1970, Ser. No. 89,156
Claims priority, application Great Britain, Nov. 19, 1969, 52,474/69
Int. Cl. B01j 17/00
U.S. Cl. 29—578 18 Claims



A method of implanting atoms of an element in a semiconductor body to change properties associated with the body, in which a layer comprising the element is provided on the body and bombarded with ions which by energy transfer cause atoms of the element to enter the body. The composition and thickness of the layer on the semiconductor body in the path of the bombarding ions being such that the majority of the ions bombarding the layer are absorbed in the layer without entering the semiconductor body.

3,747,204

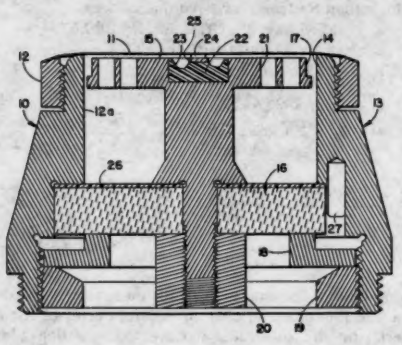
METHOD FOR MAKING AN ACOUSTIC TRANSDUCER

Bobby R. Beavers, Garden Grove, Calif., assignor to Advanced Technology Center, Inc., Grand Prairie, Tex.

Continuation-in-part of Ser. No. 650,324, June 30, 1967, abandoned. This application Dec. 4, 1969, Ser. No. 882,182
Int. Cl. H04r 31/00
U.S. Cl. 29—594 4 Claims

An acoustic transducer having the general form of a condenser microphone in which the natural resonant frequency of an edge-supported diaphragm is increased by connecting the diaphragm and backplate at places removed from the edge of the diaphragm with a liquid which is relatively immovable in response to high frequency impulses. The liquid is not

resilient, but is dissipative of energy transferred thereto from the diaphragm at frequencies as low as only a few Hertz; at



higher frequencies, it is functionally equivalent to a rigid connection.

3,747,205

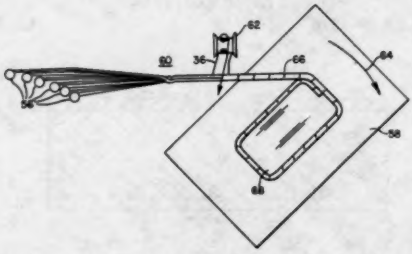
METHOD OF CONSTRUCTING A CONTINUOUSLY TRANSPOSED TRANSFORMER COIL

Harold R. Moore, Muncie, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 8, 1971, Ser. No. 187,603

Int. Cl. H01f 7/06

U.S. Cl. 29—605 **3 Claims**



Coil construction method wherein a plurality of conductor strands are transposed and then wound onto a coil form. The tranpositions are made, as the conductor is wound onto the coil form, at a position which is located between the coil form and the spools containing the strands of the conductor. Turn insulation is applied to the transposed conductor before it is wound onto the coil form. The turn insulation is flexible, thereby permitting the conductor to bend when it is wound around a corner of the coil. The turn insulation also allows the strands to slide with respect to each other while the conductor is being wound around a corner of the coil.

3,747,206

METHOD OF MAKING A HEATING ELEMENT AND FITTING ASSEMBLY

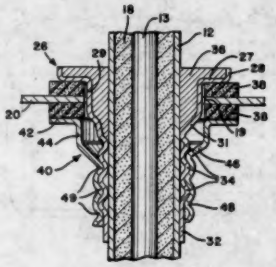
James F. Pease, 100 View Point Dr., Dayton, Ohio

Division of Ser. No. 40,258, May 25, 1970, Pat. No. 3,657,519. This application Dec. 6, 1971, Ser. No. 205,200

Int. Cl. H05b 3/00

U.S. Cl. 29—611 **6 Claims**

An electrical heating element has an end portion secured to a tubular fitting which extends through an opening within a wall of a liquid heating vessel. The fitting is produced by drawing and deforming a sheet metal disk to form a flange portion and a tubular portion having a corrugated wall configuration defining external threads. The fitting is sealed to the wall by a resilient gasket and is secured by a nut member which is also produced by drawing and deforming a sheet metal disk to form a flange portion and a tubular portion having a cor-



responding corrugated wall configuration defining complementary threads. A fitting and nut member may be used for attaching each end of a sheath-type heating element to a wall and may also be constructed for mounting a cartridge-type heating unit on the wall. The fitting may be secured to the heating element by magnetically deforming the fitting.

3,747,207

METHOD OF MAKING ELECTRIC HEATING ELEMENTS

George T. Pepino, Huntington, and Seymour Priceman, Seaford, both of N.Y., assignors to De Wiant Corporation, Detroit, Mich.

Division of Ser. No. 87,358, Nov. 5, 1970, abandoned. This application Dec. 30, 1971, Ser. No. 214,486

Int. Cl. H05b 3/00

U.S. Cl. 29—611 **4 Claims**

An electric heating element is disclosed that is capable of cyclic operation at temperatures in excess of 2500° F in an air atmosphere. The heating element consists essentially of molybdenum wire as a substrate and a relatively thin layer of molybdenum disilicide over the substrate. A process consisting of heating the coils in a non-oxidizing atmosphere with boron silicide, sodium fluoride and silicon produces the heating elements under controlled time and temperature conditions.

3,747,208

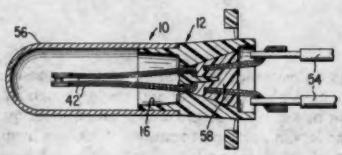
THERMALLY RESPONSIVE SWITCH AND METHOD FOR MAKING THE SAME

William D. Rattan, Paramount, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 131,205, April 5, 1971, Pat. No. 3,670,281. This application Jan. 26, 1972, Ser. No. 220,933

Int. Cl. H01h 11/00

U.S. Cl. 29—622 **6 Claims**



A thermally responsive switch and method for making the same in which a base container having a cover supports a pair

of contact elements, including at least one bimetallic element, and is filled with a hardenable material cured at the desired operating temperature of the swtch to form an integral support base. The contact elements each have a protruding tab which cooperates with an interior wall of the base container so as to properly position the contact elements in the container after the cover has been attached, to close off the bottom of the container such that the hardenable material may be retained therein, and to cause the contact elements to pviot together at their contact ends under the force of gravity whereby the switch is accurately calibrated and the contact elements are protected during assembly.

3,747,209

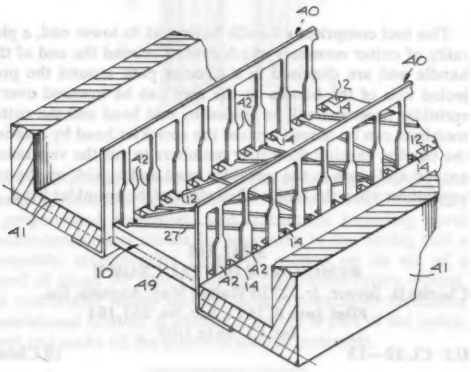
AUTOMATED WIRING SYSTEM AND METHOD

Weichien Chow, Park Forest, Ill., assignor to The Bunker-Ramo Corporation, Oak Brooks, Ill.

Continuation-in-part of Ser. No. 854,413, Sept. 2, 1969, abandoned. This application Nov. 12, 1969, Ser. No. 875,906

Int. Cl. H02g *15/00*

U.S. Cl. 29—629 **19 Claims**



A plug-in interconnection module having a desired interconnection pattern is provided by winding loops in predetermined slots of a slotted core in a predetermined sequence using a winding means whose position is automatically controlled by a computer in accordance with the interconnections desired. The loop wires in the slots are electrically connected to each other and/or to respective terminals, such as by the use of dip-soldering, infrared bonding or conductive epoxy. The loop portions on one side of the core are removed so that interconnections between terminals are provided by the remaining loops on the other side. The resulting structure is then encapsulated to form the completed interconnection module which may be plugged into printed circuit boards, mother boards and the like for providing desired interconnections between other components, such as discrete components, terminal sockets and integrated circuit modules. Electric shielding means may also be incorporated into the structure at appropriate stages during the fabrication thereof.

3,747,210

METHOD OF PRODUCING TERMINAL PINS OF A PRINTED CIRCUIT BOARD

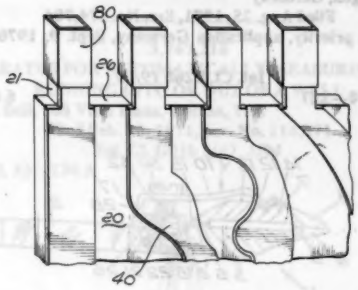
Heinz E. J. Kroll, Heroldsberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,927

Int. Cl. H05k *3/04*

U.S. Cl. 29—630 R **7 Claims**

A simple method of completely metallizing terminal pins in a pattern-like arrangement. The pins protrude from the side edge of a printed circuit board. After punching out the terminal pins, there are left elevated connecting parts between the pins which then together with the connecting parts receive a metal coating. Then these connecting parts are punched off



in order to interrupt the electric connection between the terminal pins.

ERRATUM

For Class 30—381 see:
Patent No. 3,747,649

3,747,211

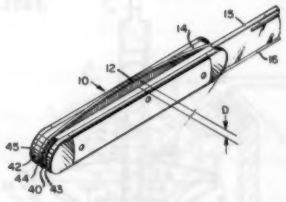
SAFETY HANDLE FOR KNIVES

Suzanne Hutchinson Calabrese, 19605 S.W. 117 Ct., Miami, Fla.

Filed Mar. 3, 1971, Ser. No. 120,480

Int. Cl. B26b *1/02*

U.S. Cl. 30—155 **4 Claims**



A knife of either a fixed blade or folding blade type has an elongated protrusion disposed outwardly from the generally flat back of the handle portion thereof. If the knife is placed on a surface with the sharp edge of its blade dangerously disposed upwardly, with the elongated protrusion from the back of the handle causes the knife to roll onto its side, thereby obviating the dangerous condition.

In a folding knife wherein the handle and blade housing are constructed of laminated metal plates, cantalever springs, and spring spacer shims, the protrusion may comprise an enlarged spring spacer shim generally centrally located at the back of the handle. In a fixed blade knife wherein the handle is formed by securing wood, plastic, or the like on both sides of the rearward extension of the blade, the protrusion may comprise an enlargement of the portion of the blade clamped in the handle portin of the knife.

3,747,212

CUTTERHEAD UNIT FOR HAIR CLIPPER

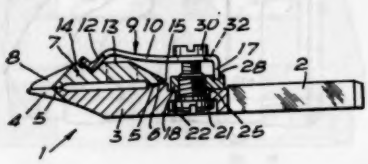
Gerhard Max Krayl, Tuttlingen, Germany, assignor to Aesculabe Werke Aktiengesellschaft vormals Jetter & Scheerer, Tuttlingen, Germany

Filed Aug. 25, 1971, Ser. No. 174,704

Claims priority, application Germany, Sept. 9, 1970, P 20 44 524.3

Int. Cl. B26b *19/06*

U.S. Cl. 30—221 6 Claims



A cutterhead unit for a hair clipper having a serrated fixed blade, a serrated movable blade engaging upon said fixed blade and adapted to reciprocate in lateral directions relative to said fixed blade, a leaf spring connecting said two blades to each other and guiding the movable blade and also pressing upon it so that it will be pressed against the fixed blade, and screw means for adjusting the positions of the blades relative to each other and for varying the pressure of the leaf spring upon the movable blade.

3,747,213

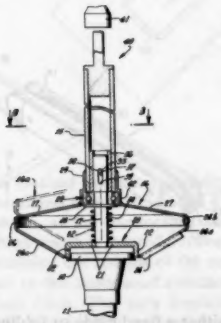
SPRINKLER ANGULAR GRASS CUTTER

Irving C. Green, 212-1/2 El Tejon, Olidale, Calif.; Joseph G. Rosales, 13513 S. Arcturus Ave., Gardena, Calif., and John O. Elmore, 4242 Francis St., Chino, Calif.

Filed July 26, 1971, Ser. No. 165,914

Int. Cl. B26b *27/00*

U.S. Cl. 30—279 R 9 Claims



A device for trimming grass adjacent a sprinkler head comprises:

a. an elongated upright shaft,

b. a rotor carried at the lower end of the shaft and having an upright axis about which the rotor is rotatable,

c. there being a guide at the underside of said rotor to embrace the sprinkler head, and

d. the rotor carrying a series of downwardly presented cutters circularly spaced about said axis, the cutters tapering downwardly and inwardly toward a lower extension of said axis, whereby clippings trimmed by the cutters in response to rotor rotation are thrown upwardly through said spaces for outward discharge.

3,747,214

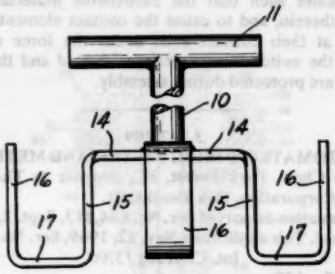
TOOL TO CLEAN OUT VEGETATION FROM AROUND SPRINKLER HEADS

Ivan C. Bohlman, 208 N. 2nd Ave., Walla Walla, Wash.

Filed Oct. 6, 1971, Ser. No. 186,937

Int. Cl. B26b *3/04*; A01b *1/00*

U.S. Cl. 30—300 4 Claims



This tool comprises a handle having, at its lower end, a plurality of cutter members which extend beyond the end of the handle and are disposed in a circular path around the projected axis of the handle so the tool can be lowered over a sprinkler head and will be guided by said head and the cutter members can be moved around the sprinkler head by rotating the handle, causing the cutter members to cut the vegetation around and close to the sprinkler head and to pick up the cut vegetation when the tool is lifted clear of the sprinkler head.

3,747,215

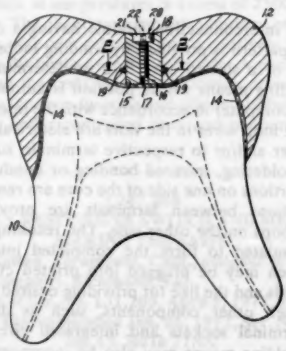
REMOVABLE DENTAL CROWN

Charles D. Joyner, Jr., 2720 Walton Way, Augusta, Ga.

Filed June 8, 1972, Ser. No. 261,101

Int. Cl. A61c *5/08*

U.S. Cl. 32—13 10 Claims

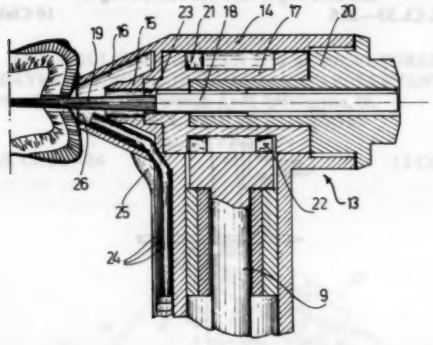


A dental crown that can be cemented to a tooth and later removed from the tooth without destroying either the crown or the tooth. The crown has an embedded, threaded sleeve extending completely therethrough. The sleeve is permanently anchored in place by lugs, and carries a removable closure screw that extends into a threaded opening in the sleeve. When it is desired to remove the crown, the closure screw is removed and a relatively long jack screw is substituted. The jack screw, which is long enough to extend thorugh and beyond the inner end of the sleeve, is manually rotated into engagement with the cement layer between the tooth and the crown and then further rotated until the cement bond is broken and the crown is freed from the tooth.

3,747,216
ANDODONTIC INSTRUMENT FOR CONCURRENT PROGRAMMED BORING, SPRAYING AND CLEANSING OF DENTAL ROOT CHANNELS

Ezio Bassi, Imola, and Francesco Riitano, Soverato, both of Italy, assignors to Cooperative Industriale Romagnola, Bologna, Italy

Filed Dec. 2, 1971, Ser. No. 203,975
Claims priority, application Italy, Dec. 5, 1970, 3633 A/70
Int. Cl. A61c 5/02
U.S. Cl. 32—57 5 Claims

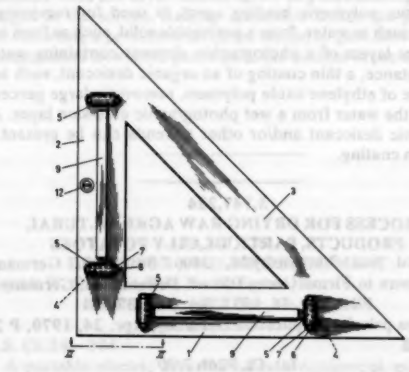


An endodontic instrument combining boring, spraying and cleansing means for concurrent operations in root channels by a programmed treatment, said instrument including novel electro-mechanical means for imparting to the boring tool a composite reciprocating rotational motion on an arc of a chord of about 90° and a uniform continuous rotary motion, the continuous rotary motion being converted to rectilinear translational motion. A suction chamber is part of the instrument and sucks off the solutions used in treatment.

3,747,217
ROLLER MOUNTED DRAWING TRIANGLE

Cornelis G. Middelbeek, Nootdorp, Netherlands, assignor to William Charles Coombs, Buckinghamshire, England

Filed Dec. 22, 1970, Ser. No. 100,700
Claims priority, application Netherlands, Dec. 23, 1969, 699309
Int. Cl. B43l 13/02
U.S. Cl. 33—109 7 Claims

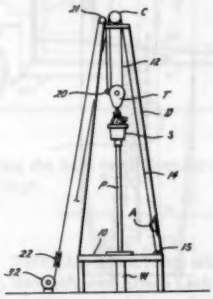


A drawing triangle having a pair of rollers in at least two of the sides, the rollers being mounted perpendicular to the edge of their respective sides. One set of rollers can be lifted from the paper either by having the sides slightly curved or having a pivot pin near the intersection of the sides having the rollers so that pressure applied on one side will cause the other side to lift.

3,747,218
APPARATUS FOR AUTOMATICALLY MEASURING PIPE RUNNING INTO OR OUT OF A WELL

Leo A. Bell, 108 Vista Plaza, Odessa, Tex.

Filed Feb. 10, 1971, Ser. No. 114,271
Int. Cl. G01b 3/12, 5/04
U.S. Cl. 33—134 A 3 Claims

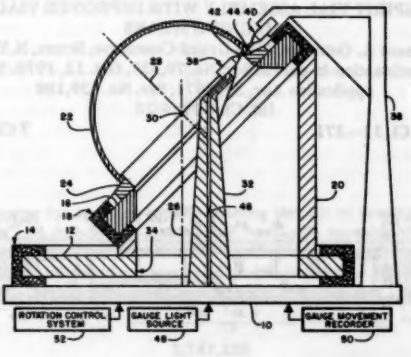


Apparatus for automatically measuring pipe running into or out of a well, whereby the amount of pipe in the well is automatically indicated.

3,747,219
GAUGING SYSTEM

Robert R. Moore, Golden, Colo., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 18, 1971, Ser. No. 107,389
Int. Cl. B23f 23/08
U.S. Cl. 33—174 L 9 Claims



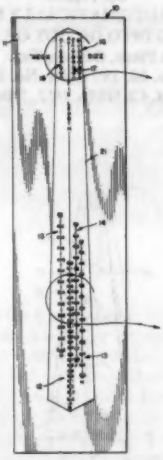
A gauging system comprising a first rotatable table, a second rotatable table mounted for rotation about an angle of 45° with respect to a rotational axis of said first table, with means for rotating the respective tables, means for mounting an object to be gauged on said second table, and indicating means for sensing variation in wall positions of said object from a central axis or point.

3,747,220

DEVICE FOR ASSISTING IN TYING A NECKTIE

LeRoy G. Weisnicht, 9407 Treetop Ln., Richmond, Va.

Filed Feb. 16, 1972, Ser. No. 226,895
Int. Cl. G01b 3/30, 5/14
U.S. Cl. 33—180 R 7 Claims



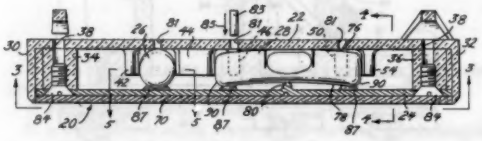
A device is provided for enabling a person to tie a necktie so that upon the completion of the knot and required adjusting the wide end will be positioned a predetermined distance below the narrow end of the tie. The device consists of a flat sheet on which are imprinted a plurality of sets of indicia. One set of indicia includes a plurality of spaced-apart numbers which are spaced from a locating point for indicating the length of the tie. Other sets of indicia comprise the same numbers as the first set, extend parallel to the first set, and are spaced a predetermined distance from a set of numbers which corresponds to the neck size of the wearer. The spacing of the numbers of the other sets from the numbers which indicate the neck size of the wearer varies depending upon the style of knot that is to be tied, for example, a Windsor, half-Windsor, or four-in-hand.

3,747,221

SPIRIT VIAL ASSEMBLY WITH IMPROVED VIAL ALIGNING MEANS

Seymour A. Ostrager, 1188 Grand Concourse, Bronx, N.Y.

Continuation-in-part of Ser. No. 79,937, Oct. 12, 1970. This application Apr. 30, 1971, Ser. No. 139,108
Int. Cl. G01c 9/28
U.S. Cl. 33—371 7 Claims



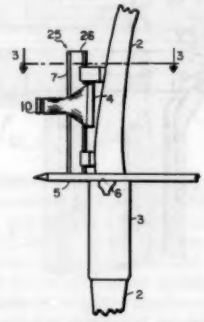
A spirit vial assembly is provided which includes a frame comprising an elongated channel having parallel side walls and a connecting web extending transversely between the side walls. The side walls and the web form a recess. A transparent cover member is provided which includes a plurality of members which project from the inner surface thereof into the recess. An elongated vial is provided which is disposed between the projecting members. The web has a projection which abuts the outer surface of the vial centrally of the longitudinal extent thereof. The vial is pivotable about the web projection to enable adjustment of the alignment of the vial with respect to the web to enable the horizontal orientation thereof.

3,747,222

BOW SIGHT

Alfred E. Benoit, 221 Whitney St., Northboro, Mass.

Filed Jan. 22, 1971, Ser. No. 108,943
Int. Cl. F41g 1/42; F41b 5/00; F41g 1/44
U.S. Cl. 33—265 10 Claims



A bow sight attached to a track on an archery bow so as to be adjustable on the bow for range and cross wind, includes an aperture channel and on the target side of the channel, a ring concentric with the aperture and pivotally mounted to the aperture so that the ring is positioned by gravity and is concentric with the aperture when the bow is held vertical and non-concentric when the bow is not held vertical.

3,747,223

CHEMICAL COMPOSITION AND PROCESS

Paul W. Faulhaber, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 693,139, Dec. 26, 1967, Pat. No. 3,591,411. This application Jan. 4, 1971, Ser. No. 103,860
Int. Cl. F26b 3/00
U.S. Cl. 34—9 8 Claims

A flexible, liquid permeable, drying element, such as a thin coating, containing an organic desiccant, typically with a synthetic, polymeric binding agent, is used for removing a liquid, such as water, from a permeable solid, such as from one or more layers of a photographic element containing water. For instance, a thin coating of an organic desiccant, such as a mixture of ethylene oxide polymers, removes a large percentage of the water from a wet photographic emulsion layer. An inorganic desiccant and/or other addenda can be present in the thin coating.

3,747,224

PROCESS FOR DRYING RAW AGRICULTURAL PRODUCTS, PARTICULARLY POTATOES

Reinhard von Nordenskjold, 3406 Bovenden, Germany, assignors to Firma Georg Dietzel, Deisenhofen, Germany

Filed Apr. 26, 1971, Ser. No. 137,591
Claims priority, application Germany, Apr. 24, 1970, P 20 20 074.2
Int. Cl. F26b 7/00
U.S. Cl. 34—12 11 Claims

A process for drying raw agricultural products for feed purposes. The raw product is first pulped into a raw and wet pulped product which is thereafter moved into a pulp box for

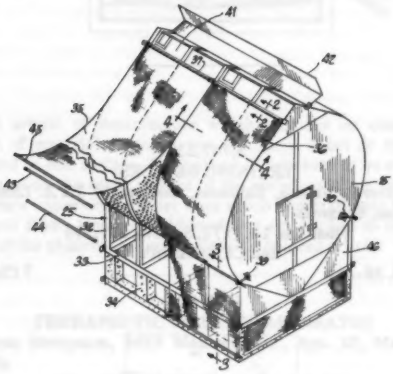
distribution onto a roller drier. The product is heated while in the pulp box, and then distributed onto the roller drier and dried while in contact therewith. The dried product is then removed from the roller drier and is thereafter broken into flakes.

3,747,225

ANTI-POLLUTION SCREEN FOR AGRICULTURAL DRYER AND METHOD OF REMOVING POLLUTANTS

Erhard E. Alms, 419 Valentia Ave., Barrington, Ill.

Filed Dec. 1, 1971, Ser. No. 203,791
Int. Cl. F26b *3/14*
U.S. Cl. 34—26 12 Claims



A simple and inexpensive anti-pollution screen and the method of using it for dryers of particulate matter are disclosed which in its preferred form make use of existing dryer frame members for supporting the screen and take advantage of the heat produced by the drying operation to prevent sticking of the unwanted particles to the screen. The normal vibration produced in the frame by the fan and burner associated with the dryer shakes down any unwanted particles lodged in the screen. Readily releasable means are provided for removing a portion or all of the screen to gain access to the accumulated unwanted particles at the bottom of the dryer.

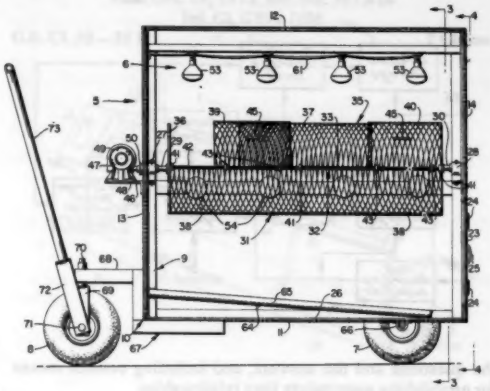
3,747,226

DRYER FOR ATHLETIC EQUIPMENT

Kermit W. Graffius, R.D. No. 2, Easton, Pa.

Filed Feb. 8, 1972, Ser. No. 224,544
Int. Cl. F26b *25/00*
U.S. Cl. 34—104 8 Claims

A portable electric dryer for athletic equipment, especially for leather equipment, which may be utilized along the side lines of athletic fields, such as a football field, for drying wet balls and other equipment. The dryer includes a mobile cabinet containing a revolving cage of open work material for receiving the balls or other athletic equipment to be dried, and which is located between electrically energized heating elements for drying the balls or equipment as they tumble within the revolving cage.

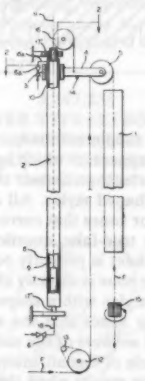


3,747,227

THREAD-APPLYING DEVICE

Thomas Zang, Hosbach, and Alfons Leeb, Kleinwallstadt, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 1, 1971, Ser. No. 194,624
Claims priority, application Germany, Nov. 12, 1970, P 20 55 570.8
Int. Cl. F26b *19/00*
U.S. Cl. 34—236 5 Claims



Device for applying rapidly running threads to heating surfaces and embodying a swingable, vertically movable thread run-over member adjacent the heating device, and a pneumatically operated counterweight-cable-pulley unit for effecting the vertical movement.

3,747,228

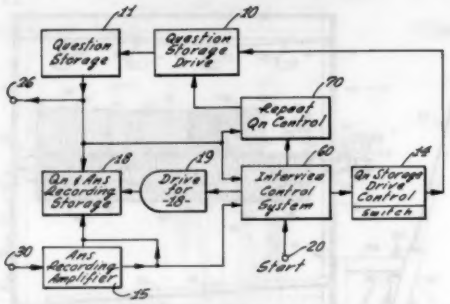
INTERVIEW MACHINE

Yujiro Yamamoto, 18611 Newton Ave., Santa Ana, Calif.

Continuation of Ser. No. 880,875, Nov. 28, 1969, abandoned.
This application Nov. 15, 1971, Ser. No. 198,527
Int. Cl. G09b *7/00*
U.S. Cl. 35—8 A 8 Claims

An interview machine having a first memory unit for storing a series of questions to be asked, mechanism for transmitting

the questions to a person being interviewed and for receiving the answers from him, a second memory unit for recording either all the answers or the complete interview including both



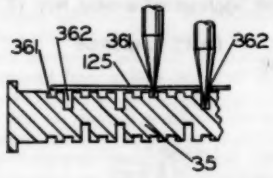
the questions and the answers, and including control means for establishing appropriate time relationships.

3,747,229

MANUAL SELF-INSTRUCTIONAL AND SELF-TESTING DEVICE

James Richard Harte, 10 W. Concord, Kansas City, Mo.

Filed May 7, 1971, Ser. No. 141,289
Int. Cl. G09b 3/08
U.S. Cl. 35—9 R **13 Claims**



This apparatus is a simple manually operated self-instructional and self-testing apparatus which has a plurality of holes in a flat impervious surface; an answer sheet, or question and answer sheet; and a shaped stylus. All question and answer sheets contain indicator zones that correspond to the answers of multiple choice or true-false questions. When a printed question and answer sheet is properly positioned on said flat surface, each indicator zone is directly above one of the holes in the flat surface. A stylus with a shaped tip is then used to perforate the indicator zones that the student believes correspond to the correct answers of the multiple choice or true-false questions. One hole of a small, intermediate, or large size or of a particular shape results when the stylus perforates an indicator zone. Different hole sizes or shapes thus produced in the question and answer sheet indicate whether the response is correct, partially correct, or incorrect.

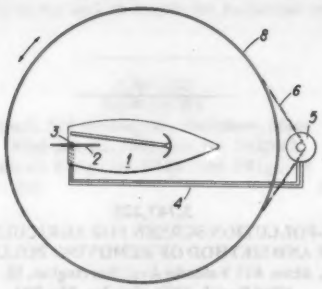
3,747,230

TRAINING DEVICES

Bruce Duval, Nassau, Bahamas, assignor to T.P.I. Limited, Nassau, Bahamas

Filed Nov. 3, 1971, Ser. No. 195,245
Claims priority, application Great Britain, Nov. 6, 1970, 52,878/70
Int. Cl. G09b 9/06
U.S. Cl. 35—11 **3 Claims**

A simulator for teaching something of the art of sailing is provided in the form of a hull unit having a helm, a display device and means responsive to the helm to move the display device, or a display on the display device, to simulate changes of the heading of the hull in response to the helm. The display device may carry a permanently applied scene, movable



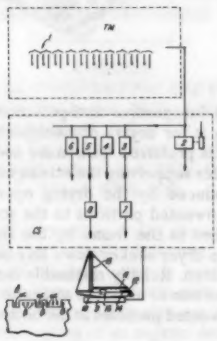
therewith. The hull unit preferably has a power-driven heeling movement for the simulation of heeling in a supposed wind.

3,747,231

TRAINING DEVICES

Bruce Duval, Nassau, Bahamas, assignor to T.P.I. Limited, Nassau, Bahamas

Filed Jan. 14, 1972, Ser. No. 217,791
Int. Cl. G09b 9/06
U.S. Cl. 35—11 **7 Claims**



A sailing simulator with which a pupil can learn something of the art of sailing without taking a sailing craft on water, has a programmable control system for controlling its behaviour, and a programming device for programming the control system so that the behaviour of the simulator may be arranged to suit the requirements of the pupil.

The programming device and programmable control system are preferably in such form that the pupil is provided with a simulation of various wind conditions including conditions in which the wind is of variable force and direction. A program may be combined with an instruction sheet so that the simulator is automatically set in a manner appropriate for the particular lesson. Desirably arrangements are made to plot the supposed course sailed by the pupil so that his performance is ready apparent.

3,747,232

COLORING SET

Asa Lynn Donaldson; Gale D. Jenkins, and Jack Lewis Lemkin, all of Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed Sept. 27, 1971, Ser. No. 184,135
Int. Cl. G09b *11/04*
U.S. Cl. 35—26 13 Claims

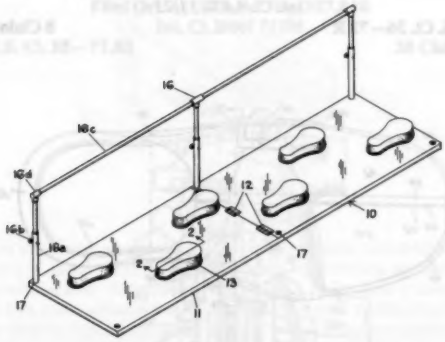
An article of manufacture which includes an absorbent sheet of material having a non-absorbent sheet or backing bonded to one surface. The outline of a picture to be colored is drawn on the other surface of the absorbent sheet by using moisture impervious barrier lines which penetrate into the absorbent sheet. Colored fluid mediums are applied to the surface of the absorbent sheet to form the colored article.

3,747,233

THERAPEUTIC WALKING APPARATUS

Carlene Berryman, 2405 Monterey Dr., Apt. 20, Madison, Wis.

Filed Mar. 29, 1972, Ser. No. 239,227
Int. Cl. A63b *23/04*
U.S. Cl. 35—29 R 1 Claim



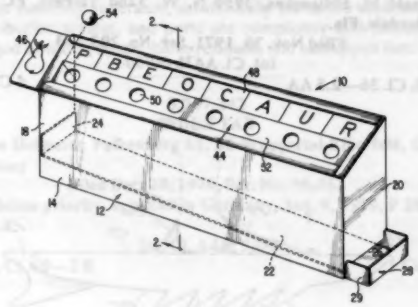
A therapeutic walking board for teaching basic walking skills to mentally retarded and physically handicapped individuals who have difficulty with coordinated physical movements. The apparatus comprises an elongate flat walkway board with a removable and vertically adjustable handrail assembly. A plurality of substantially raised resilient footprint forms are releasably adhered in a desired walking pattern on the board. An air-operated sound-emitting device is embedded in each footprint form for actuation upon compression of the form. The apparatus is collapsible for storage.

3,747,234

EDUCATIONAL APPARATUS

Harold Weinstein, 1820 Avenue V, Brooklyn, N.Y.

Filed Oct. 16, 1972, Ser. No. 297,616
Int. Cl. G09b *1/06*
U.S. Cl. 35—35 D 7 Claims



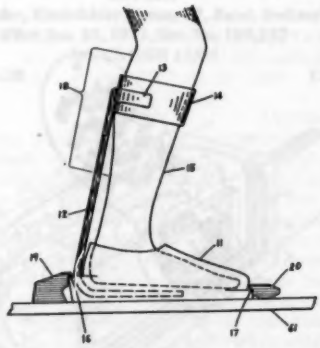
Educational apparatus including a receptacle having an open area defined by opposed parallel edges along a dimension thereof. An educational problem card is mounted on the receptacle over the open area. The card includes indicia defining an educational problem and a plurality of individual indicum, a combination of selected ones of which form a composite, correct answer to the educational problem. Openings are associated with each individual indicum on the card. The openings associated with the correct indicum are smaller than those associated with those which are incorrect. A student selects a combination of indicum as the answer to the problem posed by disposing a marker, such as a marble, in the opening associated with the indicum selected as a portion of the composite answer. If the indicum selected is correct, the marble remains seated in the opening, otherwise, it falls through the opening into the receptacle where it runs down an inclined ramp into a collection box for reuse.

3,747,235

LEVER-TYPE SKI BOOTS

Daniel Post, Box 408, Averill Park, N.Y.

Filed Aug. 29, 1972, Ser. No. 284,481
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 21 Claims



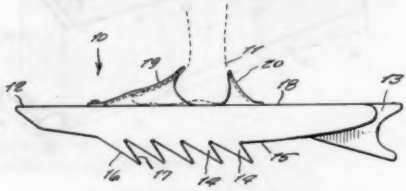
A ski boot for association with a ski, providing enhanced ski control, safety and comfort, comprising a lever element extending upwardly from a foot holder to the upper portion of the skier's lower leg and operatively associated with said leg to restrict both lateral and longitudinal motion of said lever with

respect to said lower leg, whereby motion of said lower leg during skiing is virtually completely transferred to the ski without immobilizing the ankle joint.

3,747,236
FLOTATION SHOES

Donald M. Sidlauskas, 3950 N. W. 32nd Terrace, Ft. Lauderdale, Fla.

Filed Nov. 30, 1971, Ser. No. 203,133
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AA **4 Claims**



A pair of shoes for being worn by a person so to enable him to walk upon the surface of a body of water, the device consisting of elongated shoes made of floatable material, each shoe being sufficiently large so to support the weight of the wearer, each shoe being provided with a fin tail so that the shoe moves forwardly instead of slipping sideward, and each shoe being provided with a downward extending fins or vanes on the under side thereof so to allow maximum forward motion with a minimum of slipping, the under side vanes in one form of the invention being stationary and in another form of the invention being of pivotable type so to retract into an inoperative position when the shoe is moved forwardly and wherein the vane extend downwardly into the water for holding against the water when the shoe is intended to be stationary.

3,747,237
TRACTION DEVICE

Theodore Wilowski, 66 Rd., Middle Village, N.Y.

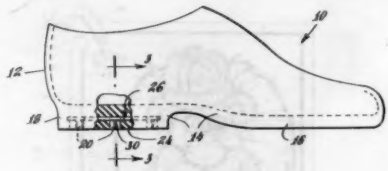
Filed May 25, 1972, Ser. No. 256,943
Int. Cl. A43b *23/28*
U.S. Cl. 36—59 C **12 Claims**

A device for improving the traction of fishing shoes has several channel elements in a zig-zag shape disposed on a member having a relatively flat surface. The elements grip a surface such as a rock. The member can be the heel or the sole of the shoes or can be a separate member that is attachable to them.

3,747,238
STUDDED FOOTWEAR

Joseph G. Jankauskas, 191 Division Ave., Shelton, Conn.

Filed Apr. 10, 1972, Ser. No. 242,617
Int. Cl. A43c *15/00*
U.S. Cl. 36—61 **10 Claims**

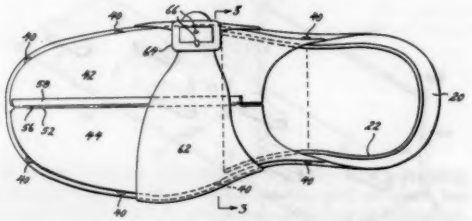


Apparatus for providing gripping studs in footwear, particularly where such apparatus is utilized on very hard surfaces such as sun baked ground, packed snow or ice. The studs are completely contained within the bottom structure of the footwear to reduce the probability of damage or injury being caused thereby when the footwear is not in use. An elastic material is utilized for the bottom structure which therefore compresses to concentrate the loads on the studs when the footwear is in use. Edges are disposed as the penetrating surface on each stud to facilitate penetration of the walking surface and to maximize the gripping surface developed for very small penetrations. Various stud configurations and arrangements are provided to orient the gripping surface in accordance with the needs of differing applications. To minimize the weight of the footwear and maximize its flexure, arcuately shaped bands are utilized for retaining the studs within the footwear.

3,747,239
SAFETY SHOE

Rex W. Green, R.D. 4, Bethlehem, Pa.

Filed Nov. 15, 1971, Ser. No. 198,647
Int. Cl. A43b *13/22*
U.S. Cl. 36—72 R **8 Claims**



A safety shoe which permits access to the toe and metatarsal regions as required to bandage or dress a wound or injury, and which has metallic arch portions which are mutually supporting when closed and which hinge at the side near the sole. The arch portions preferably abut in closed relation and by relatively slidable parallel extensions so that they can be slightly separated if necessary in use. A strap holds the arch portions together, and this strap preferably extends through a slot in the sole.

3,747,240

BLADE WHEEL FOR ROTARY SNOW PLOUGH

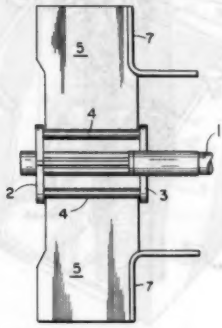
Esko Salo, Yla-Koylio, Finland

Continuation of Ser. No. 15,740, March 2, 1970, abandoned. This application Jan. 6, 1972, Ser. No. 215,893

Claims priority, application Finland, Mar. 3, 1969, 635

Int. Cl. E01h *5/00*

U.S. Cl. 37—43 B **4 Claims**



In a rotary snow plough, a blade wheel is positioned within a housing and is formed of a plurality of blades which, depending on the amount of snow directed into the housing, can pivot between an unloaded position and a fully loaded position. The blades are attached to pivot pins mounted in a hub fixed to a rotatable axle. The pivot pins are located radially outwardly from the axle. In the unloaded position each blade extends radially outwardly from its pivot pin and the axle. As a snow load is supplied, each blade deflects angularly about its pivot pin until it reaches its fully deflected or loaded position. Since the blades can deflect in either direction, the pivot pins of the adjacent blades act as stops for a blade when it reaches its fully loaded position.

3,747,241

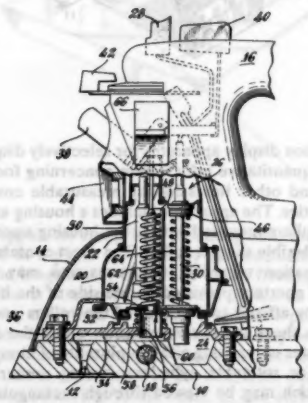
SELF-CLEANING STEAM IRON

William E. Davidson, Ontario, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed Oct. 6, 1971, Ser. No. 187,010

Int. Cl. D06f *75/06*

U.S. Cl. 38—77.83 **26 Claims**



The invention is directed to a self-cleaning steam iron with means to purge the iron of water and steam through the soleplate by providing a substantially large opening in the iron's water tank separate and distinct from the metering orifice through which water is normally dripped to make steam such as in flash boiler type irons. The large opening empties directly onto the soleplate. A valve means is provided to control this opening so the water in the tank can be suddenly dumped onto the hot soleplate so that, with the additional steam suddenly generated, substantially the entire tank, steam distribution system, and ports are completely and forcefully purged of water, steam, loose residues, and entrapped lint.

3,747,242

INDEX TAB

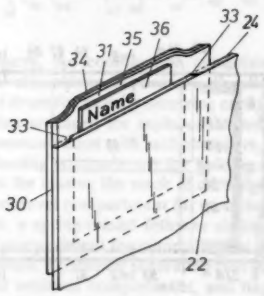
Egon Heimann, Falkenberg 61, 56 Wuppertal-Elberfeld, Germany

Filed Dec. 28, 1970, Ser. No. 97,463

Claims priority, application Germany, Jan. 9, 1970, P 20 00 798.1

Int. Cl. A44c *3/00*

U.S. Cl. 40—2 R **1 Claim**



The invention relates to index tabs which are constructed of self adhesive sheet material protected by a backing sheet. The index tab comprises a larger label portion cut from the adhesive sheet and a smaller index portion cut from the backing sheet. The part of the index tab projecting outwardly from the edge of the card consists of a part of the label portion and the index portion, whereby the upper edges of both are coinciding.

3,747,243

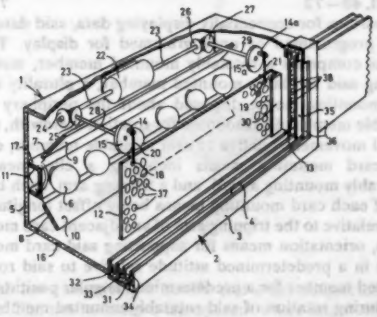
ADVERTISING DEVICE WITH FLICKERING LIGHT EFFECT

Josef Schneider, Rheinfelder Strasse 27, Basel, Switzerland

Filed Jan. 25, 1971, Ser. No. 109,237

Int. Cl. G09f *11/06*

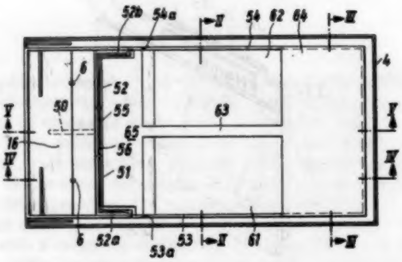
U.S. Cl. 40—30 **11 Claims**



Illuminated advertising device with high-intensity flickering light effect, comprising in a casing three replaceable light-

transmitting sheets of which the outermost carries the advertisement, the next following sheet is an ornamental sheet carrying regular projections, and the third or innermost sheet provides the flickering effect on account of a planar movement imparted thereto and having irregular projections on its side facing those of the ornamental sheet. The flicker sheet is specially made from approx. 3 millimeter thick acrylic resin. Mirrors may be provided so as to add reflected light to the direct light of incandescent lamps. A color foil may optionally be inserted between two adjoining sheets, such as the advertising and the ornamental sheets of the device. A small motor with an eccentric arrangement actuates the flicker sheet.

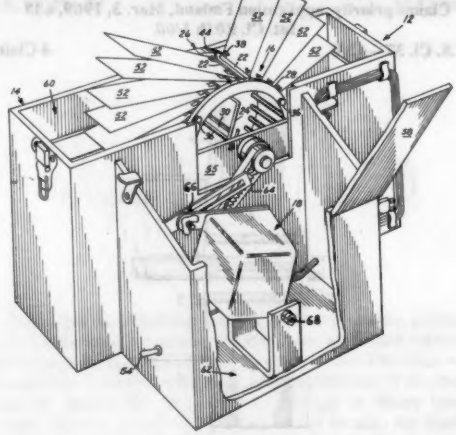
3,747,244
CARD INDEX WITH SELECTING MEANS
Walter Koller, Hagenbeckstrasse 200, Hamburg, Germany
Filed Feb. 11, 1971, Ser. No. 116,721
Claims priority, application Germany, Nov. 30, 1970, P 20 58 742.2
Int. Cl. G09f *19/00*
U.S. Cl. 40—65 6 Claims



A card index consisting of a plurality of flexible superimposed index cards mounted in a drawer movable in a case. The cards have entrainment recesses and lateral recesses which are in register and selector recesses which form a stepped arrangement in a stack of index cards. Guide means mounted on the case and on the drawer lift the index cards at their front faces in the closed position of the drawer and aid in the selection of a card. Further guide means serve to guide the cards when closing the drawer.

3,747,245
APPARATUS FOR SEQUENTIALLY DISPLAYING DATA
Lyal E. Ladine, 830 Orman Dr., Boulder, Colo.
Filed Oct. 29, 1971, Ser. No. 193,842
Int. Cl. G09f *11/02*
U.S. Cl. 40—72 7 Claims

Apparatus for sequentially displaying data, said data either being programmed or unprogrammed for display. The apparatus comprises a rotatably mounted member, means for rotating said rotatably mounted member, a plurality of data card mounting means disposed about the periphery of the rotatable member and mounted for rotation therewith, and for pivotal movement relative to said rotatable member, each of said card mounting means including a clip means for removably mounting a card, and a tripping arm, each tripping arm of each card mounting means being offset longitudinally apart relative to the tripping arm of an adjacent card mounting means, orientation means for supporting said card mounting means in a predetermined attitude relative to said rotatably mounted member for a predetermined angular position of the card during rotation of said rotatably mounted member, and an actuating means stationarily mounted with respect to said rotatably mounted member and disposed to engage sequentially each of said tripping arms during each revolution of said rotatably mounted member whereby each card will be pivoted by a predetermined amount about its associated support when

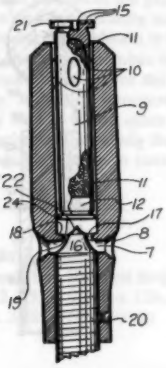


its associated tripping arm engages and is actuated by said actuating means.

3,747,246
INFORMATION DISPLAY APPARATUS
Kaya Sarier, and Ingrid Sarier, both of 3051 Edwin Ave., Fort Lee, N.J.
Filed July 12, 1971, Ser. No. 163,537
Int. Cl. G09f *11/02*
U.S. Cl. 40—86 2 Claims

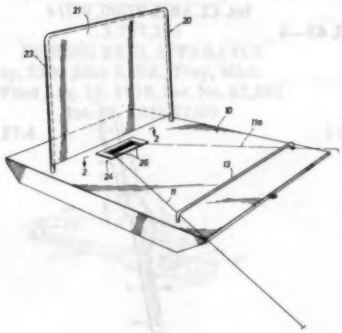
Information display apparatus for selectively displaying and indicating quantitative information concerning foods, stocks, currency and other items having measurable compositional characteristics. The apparatus includes a housing and a pair of rotatable rollers mounted within the housing upon which an elongated flexible sheet is rolled. The sheet contains quantitative information regarding the items and may be viewed through an aperture provided in one side of the housing. External knobs affixed to one end of the rollers permit movement of the sheet and the information within the aperture. A digital register comprising either a plurality of elongated slidable strips, or rotatable cylinders, having numerals printed thereon which may be viewed through rectangular windows provided in the housing, is included to allow the sum total of selected quantitative information to be recorded by the user. Alternate embodiments are considered.

3,747,247
POWERHEAD
Rhett McNair, 4343 Puu Panini St., Honolulu, Hawaii
Filed Dec. 15, 1970, Ser. No. 98,354
Int. Cl. F41c *27/00*; F42b *9/10*, *13/54*
U.S. Cl. 42—1 L 16 Claims



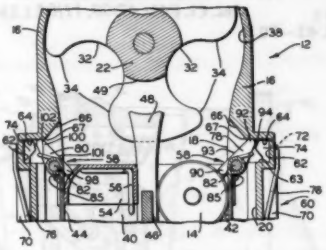
A firearm device or powerhead for use underwater by a diver and is especially useful for killing sharks etc. The powerhead is attached to a rod that serves as a handle. It is used in a manner similar to a spear. Upon contact, a cartridge is exploded and enters the target.

3,747,248
FISHING APPARATUS
Jacob F. Baer, 5810 Texas Ave., Houston, Tex.
Filed Apr. 14, 1971, Ser. No. 133,780
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.13 14 Claims



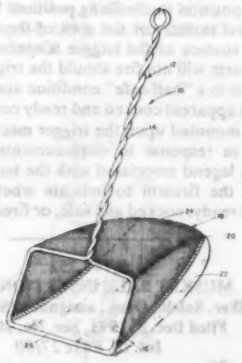
Fishing apparatus comprising a floating body on which a sail is mounted in a plane substantially perpendicular and transverse of the longitudinal centerline of the floating body. One end of a line is attached to a control device on the floating body and the other end of the line is held at a point removed from the floating body. The control device may be operable to alternately transfer the point, at which the force of wind blowing on the sail is transmitted to the line, from one side of the floating body centerline to the other. In one embodiment the control device may comprise a hand actuated reel device. In another embodiment the control device is automatically operated by a wind vane on the floating body.

3,747,249
FEEDING SYSTEM FOR AUTOMATIC FIREARMS WITH A ROTARY DRUM
Herve J. Ouellette, Springfield, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 13, 1963, Ser. No. 330,506
Int. Cl. F41d *7/04*
U.S. Cl. 42—50 5 Claims



1. In a firearm, the combination comprising a rotatable drum, annular channels in the drum, a plurality of chambers formed in said drum for radially receiving cartridges thereinto, and a magazine arranged for replaceable installation in the firearm in communication with said chambers, said magazine including a feeding compartment for holding a stack of cartridges, means for biasing the stack of cartridges towards said chambers, a retrieval compartment for receiving fired cases of the cartridges, a spring-biased follower slidingly disposed in said retrieval compartment for controlling the positions of the fired cases therein, a partition separating said supply compartment and said retrieval compartment, and fingers extending from said partition into said channels for guiding the cartridges into said chambers and ejecting the fired cases therefrom into said retrieval compartment.

3,747,250
FISH NET
Alan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Mar. 19, 1971, Ser. No. 126,237
Int. Cl. A01k *77/00*
U.S. Cl. 43—11 8 Claims



A fish net comprising a handle and a net connected to the handle. The net includes a transparent water-impervious portion which is readily deformable from that of a water-free configuration to that of a water-carrying configuration. The net furthermore includes a water-pervious portion which is con-

nected to the water-impervious portion and constitutes together with the latter an open pocket. The periphery of the open pocket, or mouth thereof, is connected to an enlarged opening provided at one end of the handle.

3,747,251

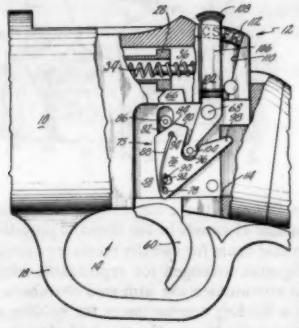
SAFETY MECHANISM HAVING COCKED INDICATOR

Richard L. Baker, Wallingford, Conn., assignor to Colt Industries Operating Corp., Hartford, Conn.

Filed Dec. 21, 1971, Ser. No. 210,316

Int. Cl. F41c *17/00, 11/04*

U.S. Cl. 42—70 D **15 Claims**



A firearm has a falling breechblock movable between retracted and battery positions. A striker, adapted to fire a cartridge, is mounted within a passage in the breechblock for movement between cocked and firing positions. The breechblock is provided with a trigger mechanism to control the release of the striker from the cocked position. The trigger mechanism includes a sear to engage the striker to maintain it in the cocked position, and a trigger to release the sear from such engagement. A cam plate member, whose discrete positions portray the firearms condition, is pivotally mounted upon the trigger mechanism and includes first and second surfaces defining an apex therebetween which are adapted to contact a roller secured to the sear. When the roller is in engagement with the first surface, the striker cannot be released from the cocked position by movement of the trigger. When the firearm is cocked and ready, the roller rests upon the second surface of the cam plate member so as to subsequently displace the cam plate member when the striker moves from the cocked position to the firing position. When the roller engages the first surface, or the apex of the cam plate member, the searing surface of the trigger is spaced from the sear so that the firearm will not fire should the trigger be pulled when the firearm is in a "half-safe" condition and then subsequently placed in an apparent cocked and ready condition. An indicating lever is mounted upon the trigger mechanism for pivoting movement in response to displacements of the cam plate member. A legend associated with the indicating lever is imprinted on the firearm to indicate whether the firearm is cocked and ready, cocked and safe, or fired.

3,747,252

MUSKET BALL INSERTION TOOL

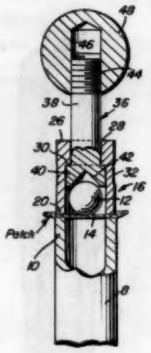
Bert A. Walker, Salem, Oreg., assignor to SWD Co., Oreg.

Filed Dec. 8, 1971, Ser. No. 205,938

Int. Cl. F41c *27/00*

U.S. Cl. 42—90 **4 Claims**

A manually usable tool embodying facilities for lining up and piloting a musket ball or minie ball into the muzzle of the barrel of a musket. It comprises a readily applicable adapter, more particularly, a sleeve which provides a chamber or receiver for the musket ball or minie ball. An end of the sleeve abuts and registers with the terminal end of the musket. The outer end of the sleeve is provided with a shouldered guide to accommodate a shouldered head on an enclosed end portion of a plunger. The plunger embodies a rod shiftably slidable in the guide, the rod having an exposed end provided with a ball-



shaped or an equivalent finger grip or knob. The plunger provides ball-ejecting means which serves to project the ball beyond the sleeve and to tamp it and its patch, if desired or used, into the coacting end portion of the muzzle prior to bringing the usual ramrod into play.

ERRATA

For Classes 43—43.13 and 43—11 see:
Patents Nos. 3,747,248 and 3,747,250

3,747,253

COMBINATION TOOL FOR FISHERMEN

Victor J. Gangi, 2244 E. Skillman St., St. Paul, Minn., and Laurice G. Skoog, Box 411, Isle, Minn.

Filed May 15, 1972, Ser. No. 253,100

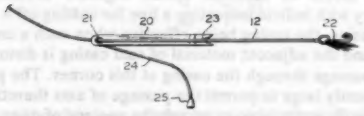
Int. Cl. A01k *97/00, 97/14*

U.S. Cl. 43—4 **9 Claims**

A combination tool for fishermen comprising a shank member with a gaff hook on one end and a perforated bowl on the other, plus a conversion assembly shiftable at will between a first and second position. The first position is that for use of the tool as a spoon to remove ice from an ice fishing hole. The

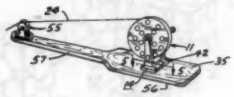
second position is that for use of the tool as a gaff hook for lifting caught fish from the hole. The conversion assembly comprises an arm member, a sheath member on one end of the arm member, and means mounting the other end of the arm member in a pivotably shiftable manner to the shank member at a location intermediate the ends of the shank member. The sheath member, in the first position aforenoted, is disposed as a cover over at least the end portion of the gaff hook to render the gaff hook inoperative and substantially non-hazardous. In the second position aforenoted, the sheath is disposed at a location laterally adjacent the shank member between the perforated bowl and the mounting means for the arm member of the conversion assembly. A biasing structure serves to urge the conversion assembly in one or the other of the first and second positions. Hand grip portions along the shank member of the tool are designed to contribute to correct and safe use of the tool.

3,747,254
TROLLING RIG
Gerard Caruso, 3390 Curtis Dr., Hillcrest Heights, Md.
Filed Apr. 22, 1971, Ser. No. 136,399
Int. Cl. A01k *87/00, 95/00*
U.S. Cl. 43—25.2 **7 Claims**



A trolling rig is provided which permits a variable supply of line and lure to trail the sinker as desired by the fisherman, yet which will release the sinker upon receipt of a strike so that the fish may be completely reeled in by the rod. The rig comprises a pin affixed to the sinker. The line passes freely through the pin and may be inserted into a friction groove to hold the distance to the lure until a fish strikes. A holder is affixed to the rod for receiving the pin as line is paid out.

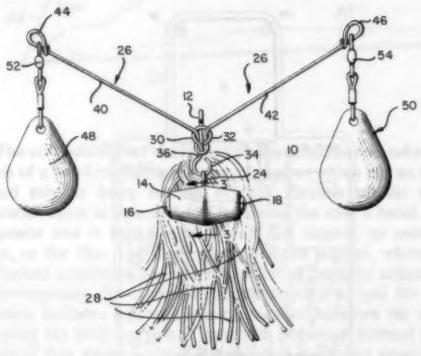
3,747,255
FISHING REEL APPARATUS
Merton B. Way, 5300 John R. Rd., Troy, Mich.
Filed Aug. 10, 1970, Ser. No. 62,592
Int. Cl. A01k *91/00*
U.S. Cl. 43—27.4 **1 Claim**



A large size, light weight fishing reel for deep water fishing having inproved features. The conventional frame around the reel spool has been eliminated and a right angle spool mounting support substituted which has a spindle for rotation of the spool thereon. A drag mechanism is provided at the end of the spindle to regulate the drag on the line. The spool is made in halves to facilitate manufacture, and the halves secured together by rivets or other means. The base of the reel mounting support is provided with interchangeable mounting seats so that the reel may be used with a fishing pole, or mounted on a boat or other support. The device is preferrably constructed of cast aluminum, but other light weight materials such as plastic may be used and the spool injection molded.

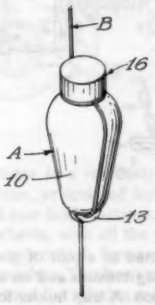
The device further includes a combination mounting means and fishing pole structure which permits indexing of the fishing pole to pre-selected position, and ready mounting and demounting of the spool and pole for attaching and removing such from the spool mounting support.

3,747,256
FISHING LURE
William A. Haddock, 1040 Palms Blvd., Venice, Calif.
Filed Nov. 3, 1971, Ser. No. 195,148
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.13 **3 Claims**



Herein described is a combination fishing lure with a novel connector assembly therefor. The fishing lure includes a hook, a weighted head connected to the shank of the hook and an eyelet coupled to the weighted head at a position towards the hook so that a relatively equal weight distribution exists between the hook and the head. The connector assembly has a link with an eye on either end thereof defining a shaft therebetween and the eyes being on relatively the same plane. An elongated member is inserted through one of the eyes around the shank of the link and back through the same eye to define a pair of V-shaped extending arms. Each arm has an eye on the end thereof and connects the eye to a suitable spinner.

3,747,257
ADJUSTABLE WEIGHT BOBBER
Peter A. Olsen, 1710 Ross Ave., Saint Paul, Minn.
Filed May 24, 1972, Ser. No. 256,273
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.14 **5 Claims**



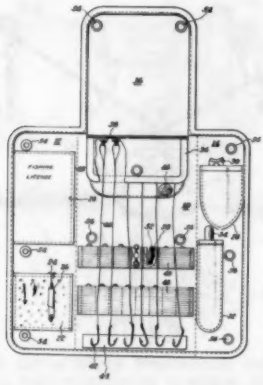
A bobber is provided with a hollow interior, and a removable cap. The interior of the bobber may be filled or partially

filled with water, sand or other material to provide a desired amount of ballast so that the bobber may be used in casting and will provide the necessary weight for casting light weight lures.

3,747,258
FISHERMAN'S POUCH

Richard W. Maciel, Cypress, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 29, 1971, Ser. No. 202,970
Int. Cl. A01k *97/06*
U.S. Cl. 43—57.5 R 1 Claim

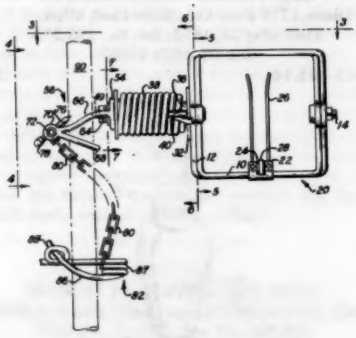


A fisherman's pouch comprising: a rear flap with oppositely disposed side flaps and a front flap secured or joined to one edge of the rear flap. Snap fasteners detachably secure the rear and front flaps together. Geber snap fasteners detachably secure the side flaps together.

3,747,259
ANIMAL TRAP AND TRAP HOLDER

Daniel W. Pellowski, R 2, Arcadia, Wis.

Filed Apr. 10, 1972, Ser. No. 242,461
Int. Cl. A01m *23/26*
U.S. Cl. 43—90 12 Claims

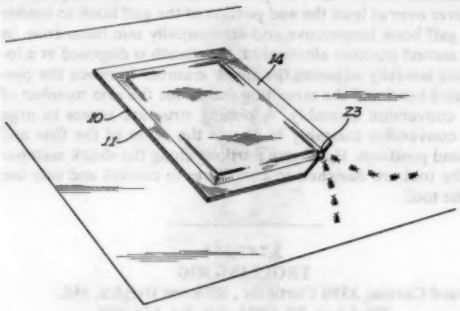


An animal trap formed of a pair of jaws movable towards each other under spring tension and an arrangement for adjusting the spring tension. A trap holder for the trap is formed of a pole, a clamp clamped to the pole, and a clamp member located above the clamp and to which the trap is secured and which releasably engages the pole.

3,747,260
INSECT KILLER

Donald E. Lovness, Stillwater, Wash., assignor to Judd Ringer Corporation, Eden Prairie, Minn.

Filed Mar. 18, 1971, Ser. No. 125,762
Int. Cl. A01m *01/02, 01/20*
U.S. Cl. 43—131 6 Claims

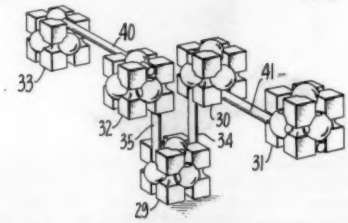


An insect poisoning and killing device for ants or similar insects in which the poison is enclosed in a casing formed by two flexible sheets of material sealed together around their periphery with indicia indicating a line for cutting off a corner of the casing, the casing being effective when such a corner is cut off and the adjacent material of said casing is distorted to form a passage through the casing at this corner. The passage is sufficiently large to permit the passage of ants therethrough but not sufficiently large to permit the passage of or to attract larger animals. The ant poison is in a solution which impregnates a plurality of folded layers of fibrous material. The passage defines a region having a maximum, distorted cross-sectional area substantially less than the normal cross-sectional area of the fibrous material, so as to retain the fibrous material in the container.

3,747,261
BALL AND ROD LINKAGE FOR JOINING POLYHEDRAL MEMBERS

Nasr Salem, 42 Opera Square, Cairo, Egypt

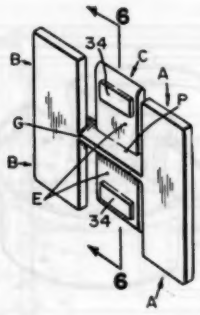
Filed Mar. 27, 1972, Ser. No. 237,864
Int. Cl. A63h *33/10*
U.S. Cl. 46—26 9 Claims



A ball-and-socket linkage for interconnecting polyhedrel members comprising a pair of balls each having four coplanar flat spots spaced at 90° intervals; a rod for detachably connecting the balls, a spherical, open socket formed in a face of each member for snugly receiving more than one-half of the surface of one of the balls, and four U-shaped grooves formed in said face and extending from the socket opening to the face edge, said grooves being spaced about 90° from each other around the opening and the diameter of the opening being

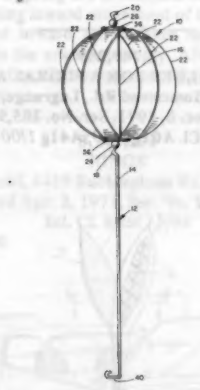
slightly greater than the flat-spot-to-flat-spot diameter of the ball. A plurality of such members and linkages are used as "executive" toys and for constructing artistic assemblages thereof.

3,747,262
CARD HOUSE TOY
John Mathew Endres, Cincinnati, Ohio, assignor to Oakley Die & Manufacturing Company, Inc., Cincinnati, Ohio
Filed June 21, 1972, Ser. No. 264,706
Int. Cl. A63h 33/10
U.S. Cl. 46—31 7 Claims



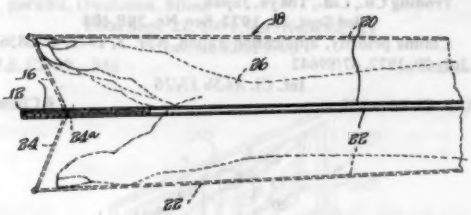
A plurality of unique connector members are provided for frictionally connecting the edge-adjacent portions of playing cards or the like for providing a card house toy.

3,747,263
PINWHEEL
Sam Grossberg, Brooklyn, N.Y., assignor to Friedman and Goodman, Brooklyn, N.Y.
Filed May 15, 1972, Ser. No. 253,185
Int. Cl. A63h 33/40
U.S. Cl. 46—58 9 Claims



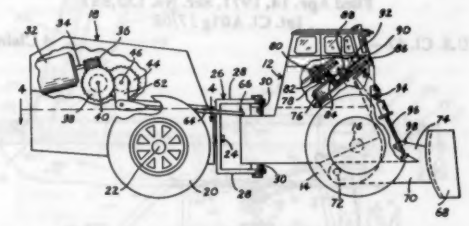
A pinwheel comprising a plurality of flexible blade members rotatably journaled on a shaft and constrained relative to one another in arcuate relation such that each of the blades are interleaved adjacent one another and present an array of generally spherical appearance.

3,747,264
HAND-MANIPULATED PUPPET
Edward K. Brandwein, 14A Lake Marian Rd., Carpentersville, Ill.
Filed Mar. 27, 1972, Ser. No. 238,543
Int. Cl. A63h 3/14
U.S. Cl. 46—154 3 Claims



The embodiment of the invention disclosed herein takes the form of a hand-manipulated type of puppet which has an elongated tubular body section of thin, flexible plastic sheet material open at one end for receiving the user's hand. The opposite end is heat sealed closed and depicts an animal's face, or the like. The body portion of the puppet, when in a collapsed condition, has one thin sheet of material adjacently superimposing the other thin sheet of material and the face portion includes a mouth section located between the sheet forming the body portion. The mouth portion is formed of an integral thin sheet portion folded upon itself and positioned between the two superimposing sheets forming the body portion and may be formed as an integral part of the body portion with the side edge portions thereof cut away and heat sealed to form the closed periphery of the mouth section. The fingers of the user's hand may be employed to effect an opening and closing action of the mouth section when used as a puppet. The body portion preferably has one sheet thereof longer than the other at the open end with an aperture formed in the longer sheet for hanging the puppet to serve as a litter bag when desired.

3,747,265
WHEEL DRIVEN ARTICULATED BULLDOZER
Robert A. Gagnon, Star Rt. 2, Box 944, Trail, Oreg.
Filed Oct. 18, 1972, Ser. No. 298,560
Int. Cl. A63l 30/00
U.S. Cl. 46—210 9 Claims



This invention relates to a remotely controlled toy in the form of a wheel driven, articulated bulldozer. The bulldozer consists of front and rear body sections, each equipped with a pair of supporting wheels, with all the wheels arranged to be driven through remote control, forward or backward, always in unison with one another. The front and rear sections of the bulldozer are connected for relative movement about a vertical axis for steering purposes, and remotely controlled means is provided for relatively adjusting the sections toward the right or toward the left, about such axis. The front and rear

sections are connected with freedom for tilting relative to one another. The front section includes a bulldozer blade which may be raised and lowered by remote control.

3,747,266

SOUNDING DEVICE

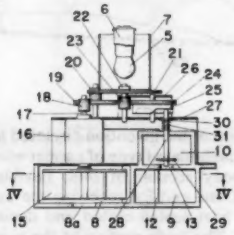
Tasuku Ono, Katsushika-ku, Tokyo, Japan, assignor to Suchiron Kagaku Kogyo Kabushiki Kaisha and Daishin Trading Co., Ltd., Tokyo, Japan

Filed Sept. 12, 1972, Ser. No. 288,405

Claims priority, application Japan, Apr. 3, 1972, 47/38361; July 29, 1972, 47/89642

Int. Cl. A63h *33/26*

U.S. Cl. 46—232 **8 Claims**



A sounding device comprising at least two resonace chambers communicating with each other through apertures formed between the adjacent two chambers and a valve rod extending through said apertures and carrying valves adapted to open or close said apertures in association with vertical movements of the rod. Therefore, the total space of the resonance chambers can be controlled by the movements of the rod and the sounds issued from a whistling mouth varies in pitch and tone. The valve rod may be operated by a cam means in association with a rotary means for rotating an air forwarding fan by means of a gear system. The sounding device may be provided with an electric lamp having a surrounding barrier which is open in one direction and adapted to rotate in association with said gear system.

Such a sounding device as described can blow a melodious tune clearly and continuously with a simple structure and be effectively employed in vehicular toys or as an instrument for auditory education.

3,747,267

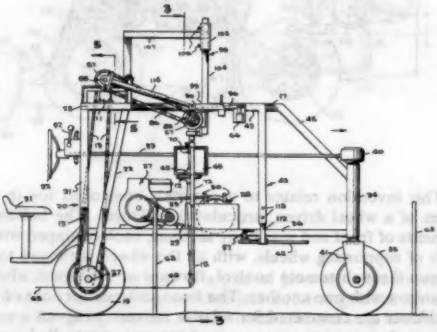
CROP TYING MACHINE

John R. Paulk, and Jacob W. Paulk, both of P. O. Box 567, Fitzgerald, Ga.

Filed Apr. 14, 1971, Ser. No. 133,857

Int. Cl. A01g *17/08*

U.S. Cl. 47—1 **4 Claims**



A method and machine for tying crops whereby strings are wrapped around stakes and plants or crops in order to support the plants, crops and the like, and wherein there is provided a means on the machine for sensing the stake, regardless of the positioning of the stake and the needles, and wherein needles that carry the strings rotate in opposite directions relative to each other, and wherein there is a means for maintaining constant tension on the strings.

3,747,268

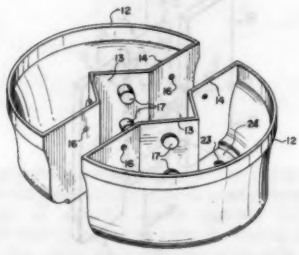
SECTIONAL EASYUP PLANTER

Marshall Linder, Rockford, Ill., assignor to AT & M Corporation, Rockford, Ill.

Filed Nov. 10, 1971, Ser. No. 197,381

Int. Cl. A01g *9/02*

U.S. Cl. 47—34 **4 Claims**



The two semicircular sections of this planter have registering vertical V-grooves defined at the middle of the abutting flat sides thereof to receive with a wedge fit the opposite sides of a generally cylindrical lamp post or the like on which the planter is to be mounted, permitting a good range of vertical adjustments to suit the taste of the owner. The half sections are identical and molded of plastic material and are tapered so as to nest neatly for compact packaging. To accommodate a variety of shapes, sizes and designs of posts, rubber grommets carried on the middle of opposite sides of each groove, project radially inwardly and can be trimmed down in length to suit different diameters of posts, some of which would otherwise be too small to fit in this planter, and they are compressible and enable clamping the planter on the smallest posts quite securely.

3,747,269

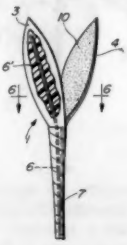
ARTIFICIAL HOLDER FOR A FLORAL ACCESSORY

Jerry Adams, 1443 Homestead Rd., Lagrange, Ill.

Filed Dec. 8, 1971, Ser. No. 205,988

Int. Cl. A01g *5/00;* **A41g** *1/00*

U.S. Cl. 47—55 **10 Claims**



An artificial holder for a floral accessory comprising an elongated floral stem reinforced by a semi-rigid flexible element, such as a wire core. A pair of floral accessory clamping jaws are supported by the stem. The jaws are fabricated from a

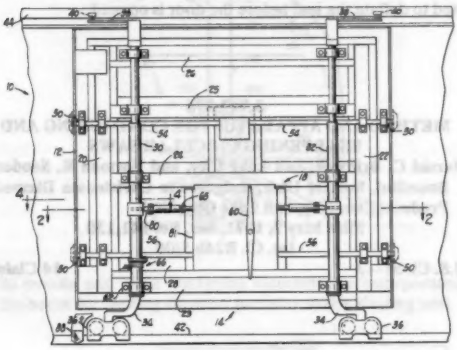
pliable material with the wire core extending into the body of at least one of the jaws. The adjacent mating surfaces of the jaws are coated with an adhesive layer which enables the jaws to clamp fixedly a floral accessory sandwiched between the jaws. A paper release W-shaped loop or an alternative release board is provided for the storage of the holder prior to its use.

3,747,270

OVER-TRAVEL AND RETURN MECHANISM FOR DOOR

Irving D. Ross, Jr., and Thorvald Madland, both of Barrington, Ill., assignors to The Youngstown Steel Doon Company, Cleveland, Ohio

Filed Feb. 8, 1971, Ser. No. 113,143
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 **4 Claims**



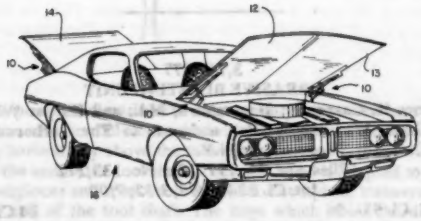
The specification and drawings disclose a plug-type door assembly particularly suited for use on rail cars. The door assembly includes the usual door member carried on vertically extending shaft and crank assemblies provided with rollers on which the door can be moved longitudinally of a door opening. Actuating means are provided for selectively rotating the crank assemblies to cause the door to move into and out of the opening. The actuating means are of the type having both anti-overspin and anti-drift characteristics. Located adjacent the door opening is a cushion member which is adapted to absorb the kinetic energy of the door. Means including a lost motion connection and a spring are associated with the crank assemblies for permitting inward movement of the leading edge portion of the door toward the cushion member when a stop member engages the crank assembly. After engagement with the cushion member, the spring assembly returns the door to a full open position.

3,747,271

HINGE

Raymond Adamski, 4419 Buckingham Rd., Royal Oak, Mich.

Filed Apr. 2, 1971, Ser. No. 130,595
Int. Cl. E05f *15/04*
U.S. Cl. 49—340 **3 Claims**



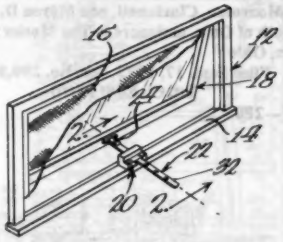
A power operated or counterbalance spring type hinge mechanism is provided wherein movement of the connected closure element is effected from the open to the closed position and vice versa by means of three links which co-act in close coupled relationship to reduce to a minimum the space requirements of the hinge structure.

3,747,272

MANUAL OPERATOR FOR AWNING SASH WINDOWS

Jerry L. Martin, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Sept. 22, 1971, Ser. No. 182,721
Int. Cl. E05f *9/00*
U.S. Cl. 49—356 **6 Claims**



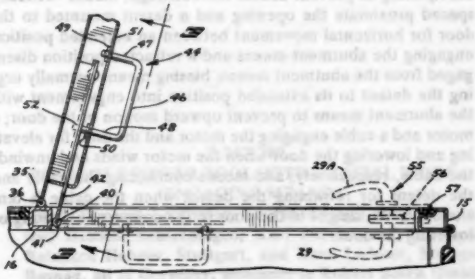
A manual operator for awning sash windows. An actuating arm for connection to a sash is received in a guide passage which includes a resilient insect guard for precluding the passage of insects through the passage and for biasing detents formed on the arm into engagement with a detent-receiving recess within the passage. The passage is configured and the insect guard arranged so that the arm can be wholly removed from the passage and easily reinserted without jamming against the insert guard.

3,747,273

DOOR CLOSURE STRUCTURE

John A. Johnson, Madison Lake, Minn., assignor to Year-A-Round Cab Corp., Mankato, Minn.

Filed Mar. 20, 1972, Ser. No. 236,317
Int. Cl. E05b *65/20*
U.S. Cl. 49—394 **4 Claims**



Door latch means for releasably securing side pivoted vehicle cab access doors in open disposition and arranged to provide a firm solid support for operator ingress and egress. The structure includes a cab frame, a door, and hinge means for controlling opening and closing of the door panel. Latch means are operatively coupled to the hinge means and are arranged to releasably secure the door in open disposition, with the latch means being pivotally secured to the cab frame about a pivot axis which is generally parallel to but spaced from the pivot axis for the door hinge. The latch includes a hinge means which is pivotally coupled to the cab frame along a pivot axis which is generally parallel to the main hinge, and which axis is

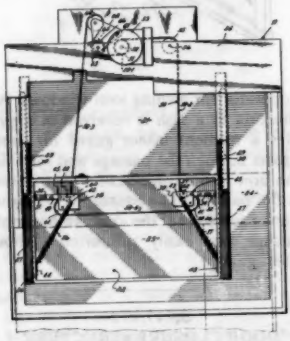
spaced from the main hinge axis. The latch hinge includes an elongated plate which is guided along the length of the door panel, and which is provided with a locking detent adjacent one edge thereof. The latch means further includes a generally "U"-shaped gripping handle having a pair of leg elements extending from the gripping handle, one leg element being arranged to engage the slotted detent formed in the hinge element, and thereby provide a gripping handle and releasable door latch.

3,747,274

VERTICALLY RECIPROCATING DOOR AND ACTUATING MECHANISM THEREFOR

Charles J. Moorman, Cincinnati, and Myron D. Goldman, Kettering, both of Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Sept. 17, 1972, Ser. No. 290,999
Int. Cl. E05f *15/16*
U.S. Cl. 49—280 **5 Claims**



Apparatus for selectively controlling access through a protected opening in the wall of a cash dispenser housing, including a vertically disposed door reciprocable between an upper position in which the opening is uncovered by the door to permit access through the opening and a lower position covering the opening to prevent access therethrough; means vertically spaced proximate the opening and a detent mounted to the door for horizontal movement between an extended position engaging the abutment means and a retracted position disengaged from the abutment means; biasing means normally urging the detent to its extended position into engagement with the abutment means to prevent upward motion of the door; a motor and a cable engaging the motor and the door for elevating and lowering the door when the motor winds and unwinds the cable, respectively; and means connecting the cable and the detent for retracting the detent when the cable is tensioned by the weight of the door in the course of elevating or lowering the door.

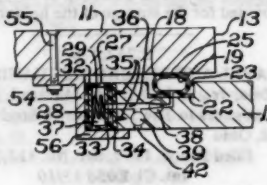
3,747,275

DOOR SEAL SYSTEM

Gerald L. May, Akron, and Scott Fulmer, Cincinnati, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,876
Int. Cl. E06b *7/16*
U.S. Cl. 49—477 **10 Claims**

A self-contained door sealing system in which an expandable tubular seal is inflated from an air reservoir for compressing air during closing of the door and cushioning the closing. Flow of air under pressure from the air reservoir to the seal is controlled to inflate and expand the seal to provide sealing contact after the door is closed. Air under pressure is released from the seal as the door opening mechanism is actuated to deflate the seal before the door is opened.

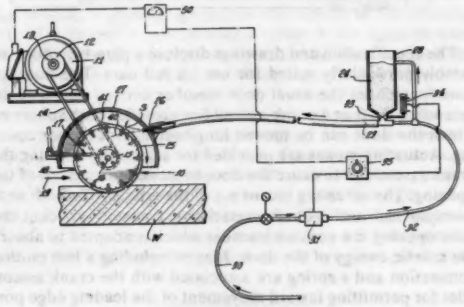


3,747,276

METHOD AND APPARATUS FOR CONTOURING AND SHARPENING CIRCULAR SAWS

Harold C. Bridwell, Salt Lake City, and Norman R. Souders, Bountiful, both of Utah, assignors to Christensen Diamond Products Company, Salt Lake City, Utah

Filed May 7, 1971, Ser. No. 141,138
Int. Cl. B24b *5/00*
U.S. Cl. 51—3 **14 Claims**



Circular saws, particularly diamond circular saws, have their rim portions contoured and sharpened during their performance of cutting operations in the work by impinging cutting or abrading materials, at timed or required intervals, against the cutting surfaces of the saw to remove some matrix material in which the diamonds, or the like, are embedded, thereby exposing them for effective and efficient cutting of the work.

3,747,277

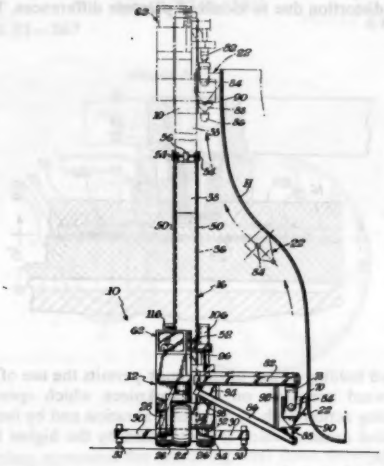
ABRASIVE BLASTING UNIT

James H. Carpenter, Hagerstown, Md., and Harper Willard Good, Waynesboro, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Apr. 12, 1971, Ser. No. 133,272
Int. Cl. B24c *3/06, 3/32, 7/00*
U.S. Cl. 51—9 **14 Claims**

An abrasive blasting unit includes a movable transporter upon which is mounted a vertical tower with a work platform secured to the tower in such a manner that the platform can be

raised up and down the tower. A boom is pivotally connected to the platform and has an abrasive blast wheel connected at



its remote end while conveying elements are incorporated in the boom for feeding abrasive particles to the blasting unit.

3,747,278

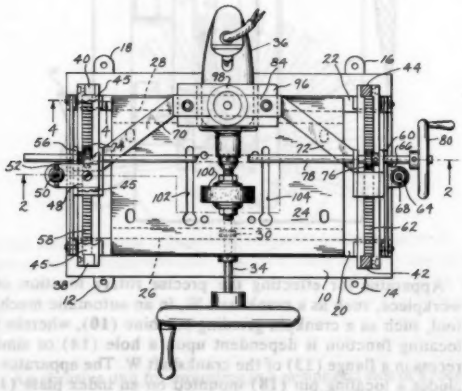
TOOL AND WORKPIECE HOLDER

Arthur F. Wolda, 1934 W. Forest Home Ave., Milwaukee, Wis.

Filed July 30, 1971, Ser. No. 167,626

Int. Cl. B24b *7/00, 9/00, 3/00*

U.S. Cl. 51—45 **7 Claims**



A portable electric drill is removably supported in a cage above a horizontal work table with the drill's tool shaft extending horizontally above the table. A grinding wheel is mounted on the end of the tool shaft. The work table is adapted to hold workpieces and is movable in a horizontal plane transverse to the axis of the tool shaft. The cage which holds the drill is movable in a horizontal plane parallel to the axis of the tool shaft and can also be moved up and down with respect to the work table.

3,747,279

HONING MACHINE

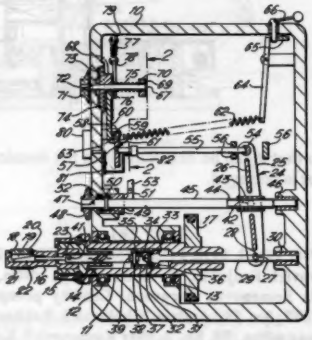
Alan John Cox, and Bryan Charles Annetts, both of Cheltenham, England, assignors to Delapena Honing Equipment Limited, Cheltenham, England

Filed Sept. 13, 1971, Ser. No. 179,633

Claims priority, application Great Britain, Sept. 19, 1970, 44,733/70

Int. Cl. B24b *7/00, 9/00*

U.S. Cl. 51—71 **24 Claims**



A honing machine has a honing tool mounted in a chuck secured to a hollow rotatable power driven spindle, and a beam with a fulcrum between its ends, said beam being located within the machine. One end of the beam is connected to a non-rotatable first stone feed rod housed in the spindle, and the end of said first stone feed rod remote from the beam is connected to a second stone feed rod which is slidable in and rotatable with the spindle and carries a device for expanding the honing tool. The other end of the beam is connected by a rod to a lever having a fixed fulcrum, said lever forming part of stone pressure control means. A resiliently loaded member contacts the lever so as to urge the beam in a direction to expand the tool, and the point of contact of the member on the lever is a variable distance from the fulcrum of said lever.

3,747,280

PORTABLE POWER TOOL WITH ORBITAL WORK-ENGAGING MEANS

Reinhold Stroezel, Leinfelden; Eberhard Vogel, Schonaich; Alfred Hettich, Echterdingen; Karl Bartholoma, Boblingen; Reinhard Hahner, Stuttgart, and Hans Lederer, Stuttgart Busnau, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 30, 1971, Ser. No. 167,746

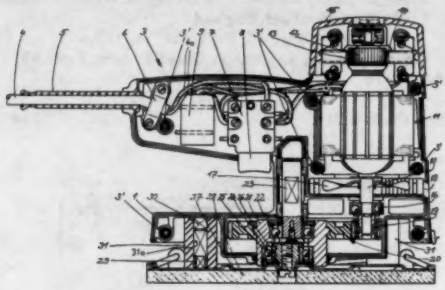
Claims priority, application Germany, Aug. 8, 1970, P 20 39 480.3

Int. Cl. B24b *23/00*

U.S. Cl. 51—170 MT **8 Claims**

A portable power-operated grinding or polishing machine wherein a plate-like work-engaging tool orbits in its own plane in response to rotation of the output member of a transmission receiving torque from a universal motor in the housing of the machine. The tool is directly connected to the housing by several elastic columns whose end portions are fitted into sockets of or receive projections provided on the tool and on

the housing. The tool is connected with an eccentric ring on the output member of the transmission by means of a single



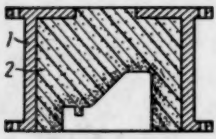
fastener so that it can be detached from the housing as soon as the fastener is removed.

3,747,281

CUTTING TOOL FOR FORMING SHAPED ARTICLES

Dmitry Lvovich Fedjukin, Novogireevskaya ulitsa, 4, kv. 106; Ljudmila Semenovna Sergeeva, Lenisky prospekt, 97 'b,' korpus 107, kv. 59; Andrei Nikolaevich Bakharev, 3 Cherkizovskaya ulitsa, 78, kv. 2; Petr Evmenovich Korochkin, N. Pervomaiskaya ulitsa, 66, kv. 32; Anatoly Izrailevich Aronov, ulitsa Vavilova, 70, korpus 3, kv. 237; Inna Leonidovna Gorlina, ulitsa Panfilova, 4/5, korpus 16, kv. 79; Arkady Timofeevich Kravets, ulitsa Vavilova, 70 korpus 3, kv. 198, all of Moscow; Emmanuil Isaakovich Goloskov, ulitsa 7, kv. 17, Leningrad; Ernest Alexandrovich Annenberg, ulitsa Shukhova, 16, korpus 4, kv. 31; Svetlana Evgenievna Fedotova, Sojuzny prospekt, 26, korpus 1, kv. 58, both of Moscow; Grigory Moiseevich Bezverkhny, ulitsa Michurinskaya, 1, kv. 55, Leningrad; Sergei Mikhailovich Tsyplakov, Oikhovskaya ulitsa, 17, kv. 23, Moscow; Jury Pavlovich Deryabin, ulitsa Kazanskaya, 4, kv. 67, and Boris Iosifovich Sitnyakovsky, ulitsa Fontanka, 134, kv. 5, both of Leningrad, all of U.S.S.R.

Filed Mar. 11, 1970, Ser. No. 887,221
Int. Cl. B24d *17/00*
U.S. Cl. 51—204 **6 Claims**



A cutting tool for forming articles which acquire in the process of machining the negative shape of said tool. The tool consists of a holder and a shaped cutting element made of a compound based on polymers and cutting particles and fastened to said holder by a joint which is capable of withstanding the load imposed by the forces of cutting and of being easily destroyed during the replacement of the cutting element.

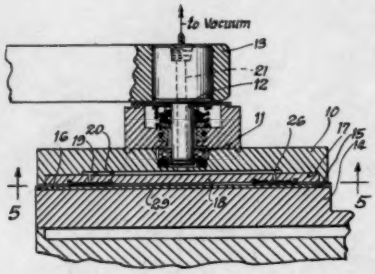
3,747,282

APPARATUS FOR POLISHING WAFERS

Ernest F. Katzke, 531 Miller Rd., Des Plaines, Ill.

Filed Nov. 29, 1971, Ser. No. 202,965
Int. Cl. B24b *47/00*
U.S. Cl. 51—235 **3 Claims**

An improved vacuum chuck for holding a thin fragile workpiece, such as a silicon wafer used as an electronic component, as the workpiece is being polished. The improved chuck has a removable and replaceable ring surrounding the workpiece to hold the workpiece in the event of an accidental loss of vacuum, and the chuck is grooved to distribute the differential pressure across the wafer over the entire wafer to avoid distortion due to localized pressure differences. The increased holding power of the chuck permits the use of higher downward pressures on the workpiece which speeds the polishing action both by increased abrasion and by increased chemical erosion which is accelerated by the higher heat of friction.

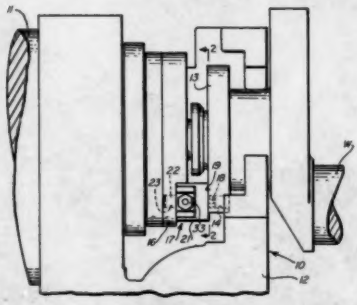


3,747,283

MECHANISM FOR PRECISION LOCATING OF A CRANKSHAFT IN AN AUTOMATIC CRANKPIN GRINDING MACHINE

Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed Feb. 22, 1972, Ser. No. 227,766
Int. Cl. B25b *41/06*
U.S. Cl. 51—237 CS **9 Claims**



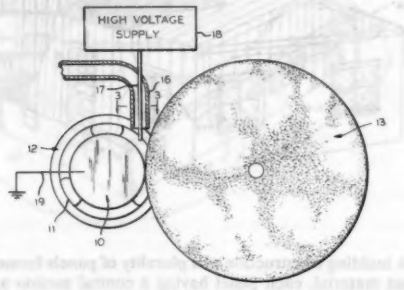
Apparatus for effecting the precise rotary location of a workpiece, such as a crankshaft W, in an automatic machine tool, such as a crankpin grinding machine (10), wherein the locating function is dependent upon a hole (14) or similar recess in a flange (13) of the crankshaft W. The apparatus includes a locating pin (18) mounted on an index plate (16). The pin (18) has an axial slot in which is mounted a pivotable locating pin driver (28). The pin driver (28) is biased by a tension spring (31) radially outwardly from the slot. Axial movement of the workpiece W brings the hole (14) and the pin (18) into engagement; the pin (18) and the pin driver (28) engage opposite surfaces of the hole (14) and apply a turning force to the workpiece to correct for any misalignment between the pin (18) and the hole (14). During the operation of the grinding machine, the pin (18) and the pin driver (28) act to maintain the angular alignment of the crankshaft W with the spindle (11).

3,747,284

COOLING APPARATUS

Felix J. Lyczko, Lake Forest, Ill., assignor to Inter-Probe, Inc., Chicago, Ill.

Filed Mar. 18, 1971, Ser. No. 125,580
Int. Cl. B24b 55/02
U.S. Cl. 51—267 6 Claims



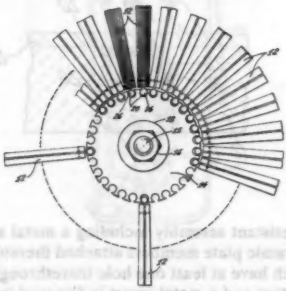
Cooling apparatus for removing heat from metal removal operations or shaft bearings by the use of a jet of liquid coolant and an electrostatic field set up in the coolant, which includes a high voltage DC or AC supply connected to a probe associated with a liquid coolant nozzle.

3,747,285

ROTARY ABRASIVE DEVICE

Aleck Block, Los Angeles, Calif., assignor to Merit Abrasive Products, Inc.

Division of Ser. No. 794,243, Jan. 27, 1969, Pat. No. 3,648,417. This application May 4, 1971, Ser. No. 140,243
Int. Cl. B24d 17/00; B24b 9/02
U.S. Cl. 51—358 18 Claims



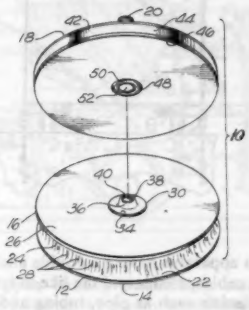
An abrasive unit for mounting in a peripheral slot of a rotary hub structure wherein the slot has a peripheral opening of less width than the major diameter of the slot, the unit embodying a retainer shaped and dimensioned to be retained in the slot against radial displacement and a web of a thickness enabling it to extend radially outward through the slot, the web and preferably also the enlargement being formed of flexible material, and a plruaity of flexible abrasive leaves anchored to the web of the retainer. In one form the entire retainer is made integral of a plastic such as nylon. In another the enlargement is primarily a rod or filler enclosed by sheet material and the adjacent flat sections of the sheet material provide the web.

3,747,286

ABRASIVE FINISHING ARTICLE ASSEMBLY

Jack M. Haigh, Rye, N.Y., assignor to Standard Abrasives, Northridge, Calif.

Filed July 14, 1971, Ser. No. 162,433
Int. Cl. B24d 9/08
U.S. Cl. 51—389 10 Claims



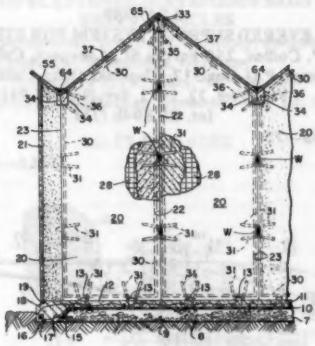
An assembly wherein a quick-coupling support member is disposed between a rotary sander pad and a finishing disk. The support member is formed on one side with a hub for releasable engagement with the sander pad and is adhesively secured on the other side to the rear side of the finishing disk.

3,747,287

MODULAR BUILDING CONSTRUCTION

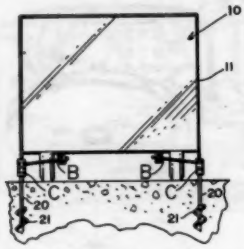
Ernest G. Finger, 1203 Vesper Dr., Fort Myers, Fla.

Filed May 4, 1971, Ser. No. 140,131
Int. Cl. E04b 7/12; E04c 2/50
U.S. Cl. 52—18 27 Claims



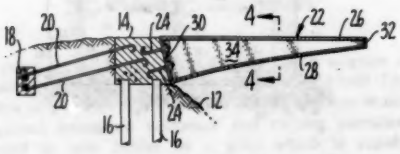
A modular building construction and method having relatively thin, reinforced concrete wall and roof panels with means exposed at spaced intervals at the edges of the wall and roof panels for joining together adjacent wall and roof panels as by welding or the like at said spaced means, with adjacent wall panels and adjacent roof panels disposed at an angle relative to one another to impart structural rigidity and strength to the building structure while enabling the use of said relatively thin wall and roof panels and eliminating the necessity for separate frame or support means.

3,747,288
DOUBLE ANCHORAGE CLAMP
Nardie F. Grimelli, 2060 Garfield St., Hollywood, Fla.
Filed Oct. 8, 1971, Ser. No. 187,753
Int. Cl. E04h *12/20*
U.S. Cl. 52—23 1 Claim



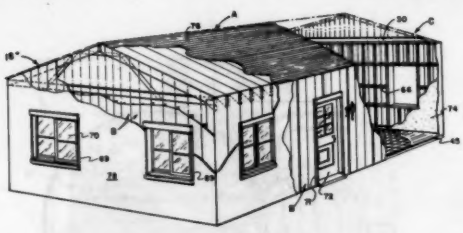
A tie-down apparatus having a double anchorage clamp for metal straps, cables, chains and the like in tying down a house trailer or materials such as pipe, tubing and lumber having a U-shape body member with a pair of bolts extending through bores in the body member; one of the bolts having a slot extending axially from the threaded end portion and terminating adjacent the other for receiving a tie-down strap and the other bolt having a radially disposed opening at its mid-portion for receiving a cable. On the outer surface of body member adjacent the bores are shoulder members which abut against the head of the bolts to prevent the rotational movement of the bolts and a locking lever plate having two openings receiving the heads of the bolts. The locking lever plate being used as both a tool to rotate the bolts and as a restraining member for preventing the rotation of the bolts when placed over the head of the bolts. The ends of the tie-down strap or cable extend to and are secured to a pair of locking brackets which are adapted to be mounted on the undercarriage of the trailer. Upon rotating the bolt with the locking tool, the strap or cable becomes tightened about the trailer.

3,747,289
CANTILEVERED SUPPORT SYSTEM FOR STRUCTURES
Eugene P. Collins, 255 Forbes St., Lakeport, Calif., and Carl W. Denner, P.O. Box 517, Clearlake Oaks, Calif.
Filed Oct. 22, 1971, Ser. No. 191,911
Int. Cl. E04b *1/34*
U.S. Cl. 52—73 6 Claims



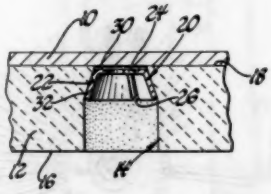
A structure such as a house provided with a support system supporting it in overhanging relation to a hillside, the system having a concrete abutment inset in the hillside but having an outwardly exposed lateral face, bearing pilings for the abutment, anchor rods and a deadman anchor further stabilizing the abutment, and a hollow cantilevered support pad tied to the exposed face of the abutment and extending horizontally over the hillside to constitute a support pad for the structure and define storage space, for example, for septic tank, utilities and storage purposes.

3,747,290
BUILDING STRUCTURE
John M. Barrell, Jonesboro, Clayton County, Ga., and Michael L. Moreland, Owings Mills, Md.
Filed July 15, 1971, Ser. No. 162,816
Int. Cl. E04c *3/07*
U.S. Cl. 52—90 10 Claims



A building construction of a plurality of panels formed from sheet material, each panel having a central section and two opposite side sections extending outwardly at right angles to one side of the central section, the panels being fastened side by side in any suitable manner to form a building or similar structure, including side walls, end walls and a roof, the walls and roof panels being covered with a re-enforced plastic material, and means carried by at least the wall and end panels for attaching thereto a second wall primarily for the purpose of refinishing the interior of the building.

3,747,291
WEAR RESISTANT ASSEMBLY
Leon A. Perigo, Arvada, and John A. Jordan, Denver, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.
Filed Aug. 13, 1971, Ser. No. 171,661
Int. Cl. B23k *9/00*; F16b *5/08*
U.S. Cl. 52—127 3 Claims

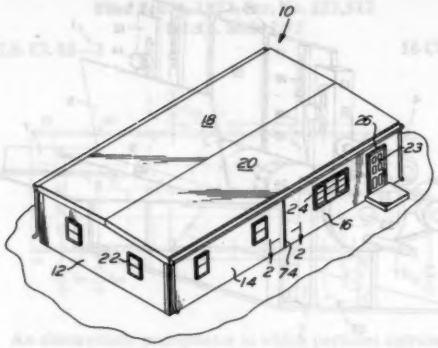


A wear resistant assembly including a metal support structure and ceramic plate members attached thereto. The ceramic plates each have at least one hole therethrough which has a tapered bottom and a metal insert is disposed in the hole, the insert being cup shaped and having its bottom welded to the metal support for attaching the ceramic plates to the metal support. The metal insert is circumferentially contractable so that when it is inserted into the hole it is frictionally retained in the hole for shipment, etc.

3,747,292
WEATHER SEAL FOR PRE-CAST STRUCTURAL PANELS
Andre Pilish, Wyncote, Pa., assignor to The Pennstar Company, Warminster, Pa.
Filed Sept. 21, 1970, Ser. No. 73,917
Int. Cl. E04d *1/36*
U.S. Cl. 52—396 3 Claims

A weather seal disclosed for use between adjacent pre-cast

panels in prefabricated buildings. Adjacent panels have juxtaposed grooves, containing interengagable resilient weather



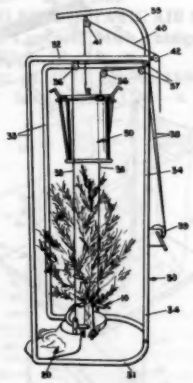
strips. An additional weather strip extends between the panels, spaced from the interengaged weather strips.

3,747,293

PACKAGING METHOD AND APPARATUS

Marion Van Slooten, West Olive, and John C. Kass, Howard City, both of Mich., assignors to Van's Pines, Inc., West Olive, Mich., by said Van Slooten and Kass

Filed Dec. 27, 1971, Ser. No. 212,336
Int. Cl. B65b *63/02, 13/20, 25/02*
U.S. Cl. 53—24 **22 Claims**



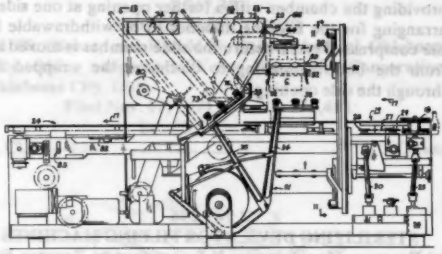
A split ring is opened and slipped around the base of a live shrub or tree. A generally rectangular flexible wrap member is secured at one end to the ring and the ring is closed. The wrap member includes closure means along its sides such that it can be closed into the shape of a cylinder. The ring and wrap member are then pulled upwardly and as the wrap member passes onto the tree, the closure means are progressively closed. When the leading edge of the wrap member is generally at the top of the tree and the tree is thereby enclosed, the ring is removed from the wrap member and a packaging sleeve is pulled downwardly from a sleeve dispenser positioned above the shrub. The packaging sleeve is pulled over the wrap and the wrap is then pulled upwardly off of the tree while the packaging sleeve is held in place.

3,747,294

PACKAGING MECHANISM

Rodney K. Calvert, Dunwoody; Dale K. Scott, Jonesboro, and Charles Rabun Landrum, Smyrna, all of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 8, 1971, Ser. No. 196,560
Int. Cl. B65b *43/28, 21/00*
U.S. Cl. 53—48 **12 Claims**



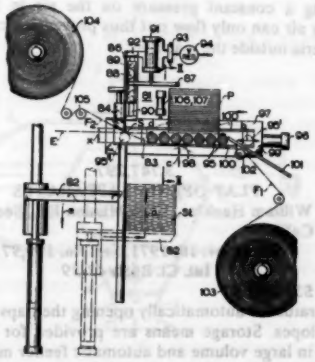
A collapsed open bottom basket style article carrier is withdrawn from a hopper by feeder means and then manipulated into partially set-up condition by the feeder means operating in conjunction with transport means which subsequently moves the partially set-up carrier into cooperative relationship with a pair of spaced guides which substantially complete the setting up operation except for the bottom wall which is open and which is disposed immediately above a continuously moving group of articles. Thereafter movable positioning means grips the handle of the carrier and positively urges the carrier downwardly into enveloping relationship with respect to the group of articles while imparting movement to the carrier in the same direction and at the same velocity as the article group is moving. Thereafter the bottom panels which are foldably joined to the bottom edges of the carton side walls are folded underneath the articles and secured together to complete the package.

3,747,295

APPARATUS FOR COMPRESSING AND PACKAGING STACKS OF FLATTENED JUXTAPOSED BAGS OR LIKE SHEET ARTICLES

Friedhelm Brinkmeier, Overbeck, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed July 7, 1971, Ser. No. 160,291
Claims priority, application Germany, July 13, 1970, P 20 34 696.7
Int. Cl. B65b *63/02*
U.S. Cl. 53—124 C **5 Claims**



In an apparatus for compressing and wrapping stacks of sheet articles, wherein each stack is introduced by a substan-

tially vertically reciprocatable plunger through a bottom opening in a compression chamber and carries with it a web of wrapping material stretched in front of the opening, the stack being compressed by the plunger against a backing member of the chamber and the web being closed as a sleeve about the compressed stack by means of a folding device before the stack is discharged, the improvement of providing a folding device comprising a slide member which can be reciprocated to and from across substantially the entire bottom opening, providing the chamber with a further opening at one side and arranging for the backing member to be withdrawable from the compressed stack before the slide member is moved away from the bottom opening to discharge the wrapped stack through the side opening.

3,747,296

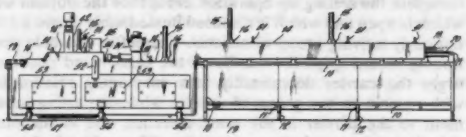
STERILIZING DEVICE FOR FILLING MACHINES

Sol Zausner, Mountainside, N.J., assignor to Zausner Foods Corp., Mountainside, N.J.

Continuation-in-part of Ser. No. 175,663, Aug. 27, 1971. This application Dec. 6, 1971, Ser. No. 205,151

Int. Cl. B65b *55/06, 55/08*

U.S. Cl. 53—167 **11 Claims**



An automatic machine for filling and capping containers for food and other materials is provided with special sterilizing means without interfering with the rapid filling and capping of containers. A combination of heat and sterilizing rays is used in a special tunnel formation in which an elevated temperature exists sufficiently high to effect sterilization of the containers passing therethrough and incorporated into the machine. Certain zones within the tunnel are maintained at predetermined controlled temperatures. The machine is particularly designed for aluminum containers having aluminum lids or caps, but is applicable to containers composed of other materials such as plastic. The entire machine is shrouded to permit pre-sterilization for a period of one-half hour to one hour prior to operation of the machine and during operation is kept sterile by providing a constant pressure on the air in the machine, whereby air can only flow out thus preventing contamination by bacteria outside the machine.

3,747,297

FLAP-OPENING APPARATUS

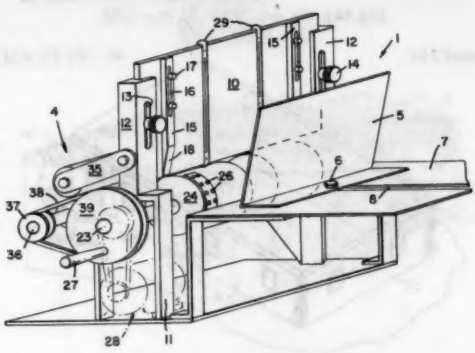
Charles William Hankins, 1218 Mission Rd., South San Francisco, Calif.

Filed Nov. 18, 1971, Ser. No. 199,971

Int. Cl. B65b *43/39*

U.S. Cl. 53—381 R **19 Claims**

Apparatus for automatically opening the flaps of a plurality of envelopes. Storage means are provided for handling envelopes in large volume and automatic feeder means are provided for feeding said envelopes into a flap-opening component of the apparatus. Flattening and ejection means automatically draw the envelopes through said feeder means and said flap-opening component and eject said envelopes from the device after the flaps thereon have been opened while simultaneously prohibiting the re-closure of opened flaps after ejection.



3,747,298

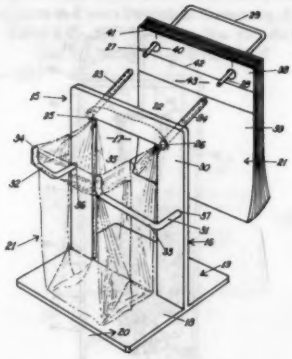
BAG DISPENSING UNIT AND THE METHOD OF OPENING AND REMOVING THE BAGS THEREFROM

Abraham Buddy Lieberman, 4755 Boulevard des Grandes Prairies, Montreal 457, Quebec, Canada

Filed Nov. 17, 1971, Ser. No. 199,612

Int. Cl. B65b *67/12*

U.S. Cl. 53—390 **10 Claims**

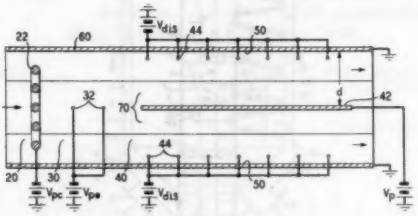


The invention refers to a wicket bag dispensing unit and consists of a vertical wall and a gate or aperture therethrough and which is integral with or otherwise secured to a base, the wall and the base combining to form a wicket bag stacking section on one side of the wall and a wicket bag opening and filling section on the other side of the wall. Wicket bag stacking means are secured to the vertical wall facing the bag stacking section, and wicket bag opening and expanding means are secured to the vertical wall facing the bag opening and filling section. The front wall of the foremost wicket bag, which has its rear wall vertically suspended from the bag stacking means, is pulled through the gate of the vertical wall and is engaged with the bag opening and expanding means, whereby the mouth of the bag, formed by the open ends of its front and rear wall, is expanded and maintained in its expanded condition until the bag is filled with the required items; the bag is then detached from the bag opening and expanding means and the bag stacking means, and carried away.

3,747,299
ELECTROSTATIC PRECIPITATOR

Ta-Kuan Chiang, 923 Mountain Avenue, Berkeley Heights, N.J.

Filed Feb. 4, 1972, Ser. No. 223,512
Int. Cl. B03c 3/12
U.S. Cl. 55—2 16 Claims

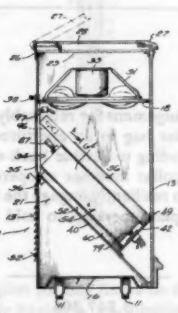


An electrostatic precipitator in which particles entrained in the gas stream are first electrically pre-charged by induction and conduction from a closed and non-emitting electrode configuration then further charged toward their saturation charge in an optimized particle charging section by corona field charging mechanism and finally collected in an optimized precipitation field. To retain the collected particles a controlled and confined electric wind turbulence is provided at the collection plates together with ion showers of the same polarity as of the charged particles. Particle reentrainment even during mechanical dislodgement is eliminated by the effective use of turbulence mixing and diffusion of the confined electric wind near at the collection wall, and is further assured by the recharging and recollection of particles accomplished by the ion showers in an optimized precipitation field.

3,747,300
PORTABLE ELECTROSTATIC AIR CLEANER

Robert F. Knudson, Concord, Mich., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 14, 1971, Ser. No. 189,146
Int. Cl. B03c 3/14
U.S. Cl. 55—126 7 Claims

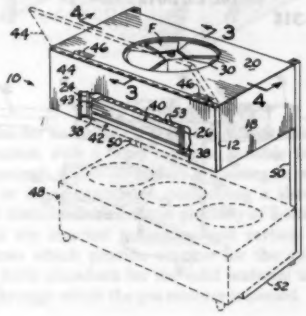


A portable electrostatic air cleaner having a case with an air inlet and an air outlet and fan means for moving air through the case from the inlet to the outlet, three tracks formed on inner case walls and extended diagonally across the case from an access opening on the rear case wall and being of different sizes, three filter elements likewise of different sizes corresponding to the tracks and received and supported thereby in a series flow sequence between the inlet and outlet specifically where the upstream filter element is a mechanical filter, the second filter element is an electrostatic air precipitator, and the downstream filter element an activated charcoal filter, the filter elements being inserted into and/or removed from the tracks through the access opening, a panel to selectively close the access opening, operating controls including a panel with normally adjustable knobs and including safety controls requiring the charcoal filter element to be in place and the panel to close the access opening before the cleaner can operate, and a screen cover on the case overlying the air outlet and all control knobs.

3,747,301
SMOKE ELIMINATOR

Boyd W. Glover, and Harold N. Rainey, both of Oklahoma City, Okla., assignors to Venus Electronics Corporation, Oklahoma City, Okla.

Filed Nov. 17, 1971, Ser. No. 199,451
Int. Cl. B03c 3/01
U.S. Cl. 55—126 5 Claims

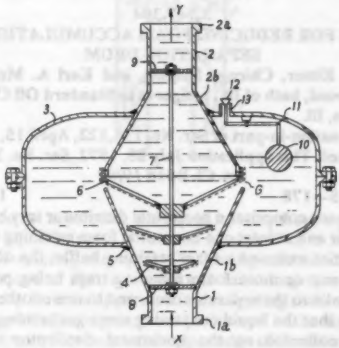


A box-like receptacle is supported in a generally horizontal plane intersecting a smoke containing heated gas stream. The receptacle is provided with vertically aligned openings in its upper and lower surfaces. Blower means within the receptacle forms a forced draft for the gas stream through the openings. An electrostatic precipitator unit is supported by the receptacle transversely of the gas stream direction of flow for collecting smoke forming particulates and cleaning the gas stream.

3,747,302
DEGASSERS

Roland Frayssinoux, Paris, France, assignor to Compteurs Schlumberger, Montrouge, France

Filed Apr. 7, 1972, Ser. No. 242,063
Claims priority, application France, Apr. 7, 1971, 712244
Int. Cl. B01d 19/00
U.S. Cl. 55—164 8 Claims



A degasser comprises vertically disposed inlet and outlet tubes, which are aligned with each other and which have their

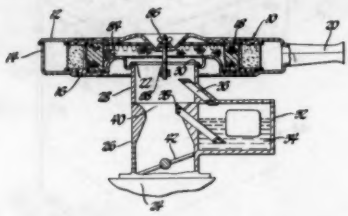
adjacent ends spaced apart to define a gap. An annular chamber surrounds the adjacent ends of the tubes so as to contain this gap. The inlet tube, which is beneath the outlet tube, contains a plurality of inverted conical filters, the periphery of the uppermost filter being secured around the periphery of the lower end of the outlet tube. As a liquid containing bubbles enters the inlet tube of the degasser, the liquid passes through the filters to the outlet tube, but the bubbles are deflected radially outwardly and upwardly by the undersides of the filters, and enter the chamber via the gap.

3,747,303

AIR-FILTER AND CARBON-BED ELEMENT FOR AN AIR CLEANER ASSEMBLY

Robert K. Jordan, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1971, Ser. No. 148,521
Int. Cl. B01d *53/04*
U.S. Cl. 55—318 **3 Claims**



A ring of activated carbon particles for adsorbing and desorbing hydrocarbon vapors rising from a fuel reservoir in a carburetor of an internal combustion engine. The ring has an elevated portion above a base portion. Both portions extend between an air inlet side and an air outlet side and between top and bottom surfaces for securing and sealing the ring across the air path through an air cleaner. The elevated portion has passages that conduct air for the normal operation of the engine from the air inlet side of the ring to the air outlet side. Hydrocarbon vapors adjacent the outlet side from the carburetor are adsorbed by the carbon in the base and elevated portions before rising to the level of the passages. With the engine running, the vapors previously adsorbed are desorbed by air flowing from the inlet to the outlet side of the air cleaner into the carburetor.

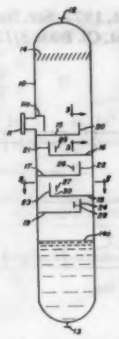
3,747,304

MEANS FOR REDUCING FOAM ACCUMULATION IN A SEPARATION DRUM

Gary W. Elmer, Chicago Heights, and Karl A. Muller, Jr., Homewood, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 134,122, April 15, 1971, abandoned. This application July 28, 1972, Ser. No. 276,107
Int. Cl. B01d *19/02*
U.S. Cl. 55—178 **11 Claims**

The means comprises a horizontal distributor tray having an outlet weir and at least one horizontal foam retaining tray having an outlet weir and a foam retaining baffle, the distributor tray and one or more foam retaining trays being positioned with the inlet to the separator drum and to one another in such a manner that the liquid containing some gas coming into the drum is collected on the horizontal distributor tray and directed in a descending stream from the distributor tray to fall upon and be collected by the foam retaining tray located directly below so that liquid collected on the foam retaining tray will flow under the foam retaining baffle and over the outlet weir of the foam retaining tray in a descending stream. Additional foam retaining trays would see the descending liquid in sequence.

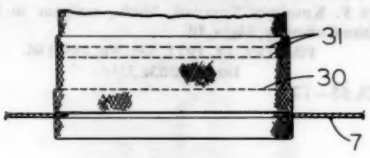


3,747,305

TUBULAR GAS FILTER APPARATUS

Leonard J. O'Dell, and William R. Hamilton, Jr., both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 16, 1971, Ser. No. 134,629
Int. Cl. B01d *46/02*
U.S. Cl. 55—341 **7 Claims**



An improved arrangement for releasably connecting an end of a tubular gas filter bag to an apertured plenum chamber plate member, including a flexible back-up band and a surrounding resilient collar member cooperatively mounted at the end of the bag to resiliently engage the surrounding wall of an aperture in the plate member to hold the bag end in fast position.

3,747,306

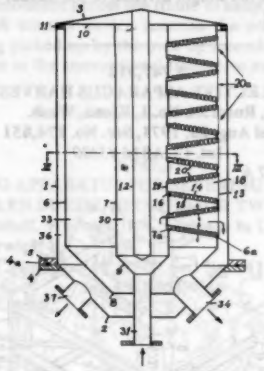
ARRAY OF CYCLONIC SEPARATORS

Nils Anders Lennart Wikdahl, 42 Bravallavagen, Djursholm, Sweden

Filed Sept. 17, 1970, Ser. No. 72,951
Claims priority, application Sweden, Sept. 29, 1969, 13322/69
Int. Cl. B01d *53/24*
U.S. Cl. 55—349 **20 Claims**

Apparatus is provided containing an array of cyclonic separators in which the separators are oriented about a common geometric axis, to which the geometric axis of each separator is preferably disposed at the same angle. The groups of cyclonic separators are in turn oriented about a common

geometric axis, to which the geometric axis of the groups is preferably disposed at the same angle.



The array arrangement is particularly suited for small cyclonic separators, of the type useful in separating mixtures of gases.

3,747,307

TELESCOPIC SUPPORT FOR BAG FILTERS

William J. Peshina; William F. Peshina, both of North Royalton, and Roger F. Stevers, Cleveland, all of Ohio, assignors to Royal Wire Products, Inc., North Royalton, Ohio

Filed Dec. 27, 1971, Ser. No. 212,333
Int. Cl. B01d *46/02*
U.S. Cl. 55—379 11 Claims

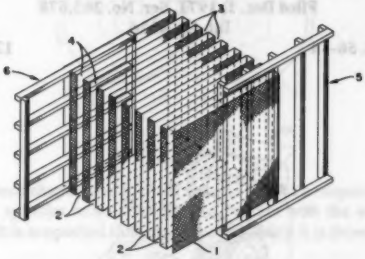
A telescopic support for bag filters or the like including an outer cage assembly having a top thimble and an inner cage assembly selectively telescoped within the outer assembly, the top of the bag filter being clamped to the thimble with the remainder of the bag being suspended therebelow about the support. Each cage assembly is substantially cylindrical and includes a plurality of interconnected vertical and horizontal wires. The wires of the two cages are cooperatively configured to permit relative axial sliding of the assemblies for expansion and contraction of the support without relative rotation of such assemblies. The support may be expanded to a maximum longitudinal extent coincident with the length of the bag filter, and the two cage assemblies are interlocked at maximum expansion by cooperative interengagement of wires on such assemblies.

3,747,308

GAS TREATING APPARATUS

Roeland Versluis; Jacob Schinkelshoek, and Pieter J. Schuurman, all of The Hague, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 1, 1972, Ser. No. 222,505
Int. Cl. B01d *53/04*
U.S. Cl. 55—387 7 Claims



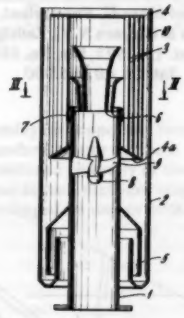
Apparatus for contacting a gas mixture containing undesirable compounds with a solid material suitable for removing such compounds which comprises a housing in which is situated one or more containers comprising a sheet of a gas-permeable material folded into a plurality of S-shaped creases into which are inserted horizontal and vertical ladder-type constructions which provide support for the gas-permeable sheet and form chambers for the solid material and open gas channels through which the gas mixture is passed.

3,747,309

DEVICE FOR SEPARATING LIQUID FROM A GAS-LIQUID OR VAPOR-LIQUID MIXTURE

Franz Meier, Oberhausen-Sterkrade; Erich Ossendorf, Bochum, and Hubert Wolfgarten, Oberhausen, Sterkrade, all of Germany, assignors to Gutehoffnungshuette Sterkrade A. G., Oberhausen-Sterkrade, Germany

Filed Apr. 15, 1971, Ser. No. 134,228
Int. Cl. B01d *45/12*
U.S. Cl. 55—440 8 Claims



A device for separating the liquid fraction from a gas-liquid or vapor-liquid mixture,is formed of a riser tube containing means for rotating the upwardly flowing mixture. Enclosing the upper end of the riser tube and extending upwardly and downwardly from its upper end is a collecting shell with angularly shaped deflecting surfaces positioned in the shell which extend from a point below the upper edge of the riser tube to a point spaced upwardly from the upper edge of the riser tube. An inverted U-shaped baffle is arranged at the upper end of the riser tube to direct the liquid fraction into the collecting

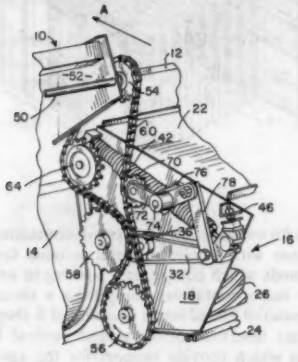
shell and concentrically arranged deflector tubes are positioned above the riser tube for directing the separated gas or vapor fraction through the deflecting surfaces.

3,747,310

HAY CONDITIONER DRIVE

Robert A. C. Calder, Hamilton, Ontario, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed Dec. 1, 1971, Ser. No. 203,678
Int. Cl. A01d
U.S. Cl. 56—1 **12 Claims**



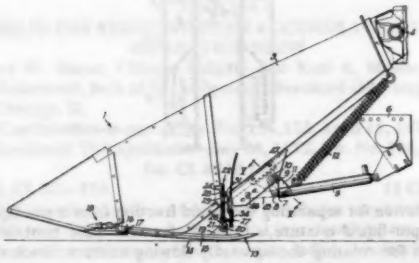
A crop harvesting platform including a pair of crop conditioner rolls for crimping or crushing hay therebetween to facilitate curing or drying of the crop. One of the rolls is mounted for movement toward and away from the other roll to accommodate varying thickness of the crop passing between the rolls. The rolls are power driven by a system including a flexible drive chain and a movable idler sprocket operable to vary the path of travel of the chain in response to movement of the movable roll relative to the other roll.

3,747,311

MECHANISM FOR THE AUTOMATIC ADJUSTMENT OF THE HEADER OF HARVESTING MACHINES

Frans J. DeCoene, and Marc G. Vansteelant, both of Zedelgem, Belgium, assignors to Clayson N.V., Zedelgem, Belgium

Filed Oct. 13, 1971, Ser. No. 188,835
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **15 Claims**



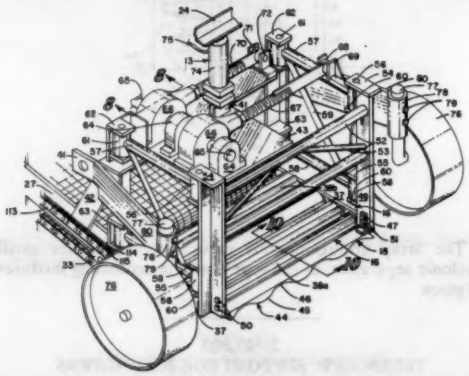
Mechanism for the automatic height adjustment of an agricultural machine part, especially of the header of a harvesting machine, with the property that it mainly consists in the combination of slide shoes, pivotally fixed underneath the header; between the latter and the header elements which try to push these slide shoes away from the header and elements which at any relative displacement between the slide shoes and the header, automatically provide for a new equilibrium position as far as the weight division of the header-straw elevator is concerned.

3,747,312

NONSELECTIVE ASPARAGUS HARVESTER

John D. Duncan, Rural Rt. No. 1, Kiona, Wash.

Filed Aug. 25, 1971, Ser. No. 174,851
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 A **7 Claims**



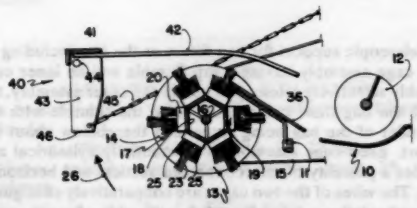
A mechanism to nonselectively cut all asparagus stocks above a certain elevation in a given area and present the cut spears for further processing. The mechanism is attached to a tractor for locomotion and power. It provides an oscillating, crenated cutting bar located between the tractor wheels for adjustable vertical positioning with plural pickup rolls therebehind to transfer cut asparagus spears on a soil bed to a rearward transit conveyor which separated the soil and transfers the asparagus spears to an elevating conveyor from which they are disposed for sorting and packing. The crenate configuration and reciprocating motion of the cutting blade provides a self-sharpening reaction in abrasive soil. The mechanism provides fine vertical adjustment of the cutter relative the earth's surface.

3,747,313

PICK UP DEVICES FOR AGRICULTURAL IMPLEMENTS

Frederick Warren Denzin, Box 34, Site No. 4, R.R. No. 1, Regina, Saskatchewan, Canada

Filed Mar. 31, 1972, Ser. No. 240,164
Int. Cl. A01d *89/00*
U.S. Cl. 56—364 **2 Claims**



A cylindrical pick up has a plurality of brushes mounted thereon having relatively long heavy bristles in the center and relatively short soft bristles on either side thereof, said bristles

extending clear across the width of the pick up. This pick up is rotated and bends the stubble thus facilitating efficient pick up of the swath without the danger of picking up stones. Cleaning fingers are mounted across the frame to keep the bristles clean and a swath control device controls the compaction of the swath being picked up by the pick up assembly prior to transferring same to the conventional transverse auger.

3,747,314

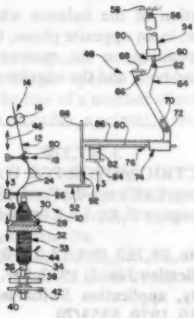
SEVERING APPARATUS FOR SEVERING BALLOONING YARN DURING SPINNING OR TWISTING

Herbert Kilduff, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed May 10, 1971, Ser. No. 141,841

Int. Cl. D01h *9/16*

U.S. Cl. 57—34 R **10 Claims**



A "balloon" is formed by an advancing yarn and is deflected to cause the yarn to be severed. In one environment, a tender patrols spinning stations of a spinning machine and automatically stops to service any of the stations requiring servicing which might occur, for example, because a bobbin being wound at the station is full. Upon stopping at a station, an operating assembly on the tender causes a yarn guide of the station to be retracted, and also causes a deflecting unit on the tender to deflect normal ballooning of the advancing yarn. This action, in turn, slows or stops a ring traveler which normally carries the advancing yarn about the bobbin, thus increasing the advancing speed of yarn while its withdrawal rate remains constant, and thereby severing the strand. In another environment, a supply bobbin is stationary and over-end withdrawal of the unwinding end at a generally constant speed causes the yarn to balloon transversely of the bobbin which facilitates faster unwinding. The balloon is deflected so that the yarn cannot be withdrawn as rapidly from the supply bobbin resulting in severing of the yarn.

3,747,315

SPINDLE DRIVING MECHANISM

Arthur Averil Paget, Harrogate, England, assignor to Scriven & Paget Limited, London, England

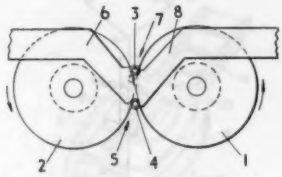
Filed Dec. 7, 1970, Ser. No. 95,774

Claims priority, application Great Britain, Dec. 8, 1969, 59,866/69

Int. Cl. D01h *7/92*; D02g *1/06*

U.S. Cl. 57—77.45 **7 Claims**

A two spindle driving mechanism comprising two closely separated co-planar driving and support wheels, of which one at least is power driven, and with which the two spindles are rotatably engaged respectively on opposite sides of a plane containing the wheel axes, and two magnets each having a



pole piece shaped and located so as to attract a respective one of said spindles more strongly into contact with the wheel by which it is supported than the wheel by which it is driven.

3,747,316

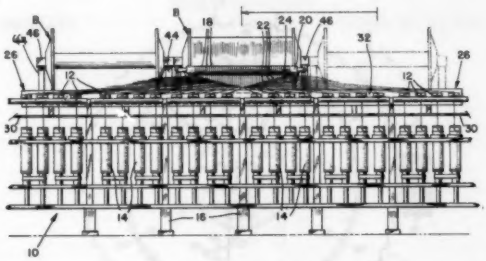
MOBILE BEAM CARRIAGE ASSEMBLY

Edwin Morgan, Laurinburg, N.C., assignor to Morgan Mills Incorporated, Laurel Hill, N.C.

Filed Sept. 7, 1971, Ser. No. 178,345

Int. Cl. D01h *13/02, 13/04*; B65h *49/00*

U.S. Cl. 57—90 **10 Claims**



A carriage assembly for supporting two or more yarn supply beams upon a standard twister machine so that either of the beams may be positioned centrally of the machine inspection rolls and guide boards such that yarn may be directed to spindles or bobbins arranged on one or both sides of the twisting machine.

3,747,317

GUIDE DEVICE FOR SEPARATING YARN ENDS

Thomas Edward Willis, Martinsville, Va., assignor to E. J. du Pont de Nemours and Company, Wilmington, Del.

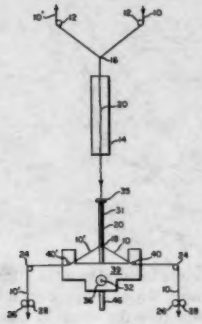
Filed Feb. 23, 1972, Ser. No. 228,710

Int. Cl. B65h *57/16*; D02g *1/02*

U.S. Cl. 57—106 **3 Claims**

A Duotwist-type texturing machine is modified by replacing fixed yarn separation pins with a pivotal apparatus for stabilizing the separation point of two twisted together yarns. The apparatus carries a vertically extending sensor arm with a yarn

guide on one end through which the twisted together yarns pass and cylindrical yarn separation pins. Yarn snubbing angles about the pins vary compensatively to tension imbalance as the latter causes pivoting of the apparatus.

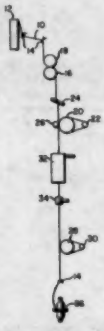


3,747,318

FALSE-TWIST TEXTURING YARN WITH TORQUE JET

Stanley R. Cochran, Martinsville, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 20, 1971, Ser. No. 173,426
Int. Cl. D02g *1/02*
U.S. Cl. 57—157 TS **5 Claims**



A process is disclosed for false-twist texturing yarn of synthetic thermoplastic polymer containing dispersed microscopic particles of an additive which is substantially insoluble in and unreactive with the polymer and is liquid at yarn temperatures used for heat-setting twist in the yarn. The examples illustrate improvements in twist-crimp obtained when the yarn contains 3.5 percent and 6.0 percent additive and false-twisting is accomplished at low tension with a torque jet.

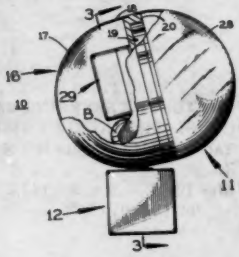
3,747,319

ROTATABLE DISPLAY CLOCK

Morris Riba, 2881 W. 12th St., Brooklyn, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,484
Int. Cl. G04b *45/00, 37/00*
U.S. Cl. 58—2 **10 Claims**

A display clock includes a base upon which a clock body is mounted for free rotation about a vertical axis. The clock body includes a housing having a vertically extending dial defining front face and a battery energized clock motor is mounted on the front face and drives the clock hands. The clock motor includes a pair of coaxial balance wheels which oscillate about a vertically extending axis and a battery energized network periodically pulses a pair of magnets on the balance wheels to maintain the balance wheel oscillation.



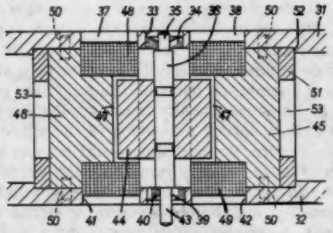
With the oscillation of the balance wheel the clock body reacts to oscillate, in an opposite phase, the oscillating stroke of the body depending on the moments of inertia of the balance wheels and body and the angular stroke of the balance wheels.

3,747,320

ELECTRIC MOTOR FOR WATCHES

Georges C. Vuffray, La Chaux-de-Fonds, Switzerland, assignor to Girard-Perregaux S.A., La Chaux-de-Fonds, Neuchatel, Switzerland

Division of Ser. No. 79,753, Oct. 12, 1970, Pat. No. 3,652,884. This application Jan. 5, 1972, Ser. No. 215,573
Claims priority, application Switzerland, Oct. 13, 1969, 15381/69; Apr. 10, 1970, 5353/70
Int. Cl. G04b *1/00*
U.S. Cl. 58—23 D **12 Claims**



An electric motor for watches, composed of a rotor with permanent magnetization, a stator winding without core and with even spirals which presents a symmetrical plane parallel to the spirals and containing the axle of the rotor, a winding support made of non-magnetic material and an annular yoke made of a ferromagnetic material with high permeability and low remanence surrounding the support.

3,747,321

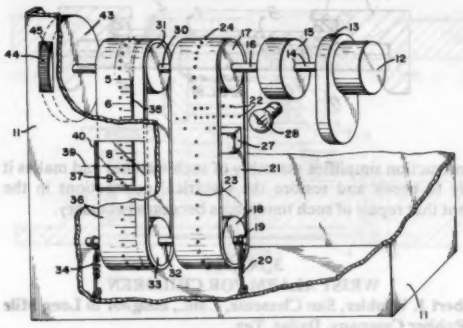
TIME OF DAY CLOCK

Norman Yudewitz, Westport, Conn., assignor to Pitney-Bowes-Alpex, Inc., Danbury, Conn.

Filed Apr. 3, 1972, Ser. No. 240,504
Int. Cl. G04b *3/00*
U.S. Cl. 58—23 C **6 Claims**

A clock that provides visual and electrical output signals that may be used, for example, to record time-controlled operations is shown and described. An endless tape encoded to indicate discrete increments of time through a pattern of

translucent and opaque portions is driven continuously and at a uniform rate of speed in order to complete one full revolution in each 24 period. As the coded portions of the tape are drawn in sequence past a photoelectric reader, the electrical



output generated in response to specific luminous stimuli is fed through a decoder to operate or record upon an output device which may be one of a number of suitable conventional devices, e.g. a tape recorder, a printer, a record chart, etc.

3,747,322

LIGHT CONTROL FOR TIMING DISPLAYS

James H. Eckenrode, Millersville, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.

Filed May 20, 1971, Ser. No. 145,425

Int. Cl. G04b *19/30*

U.S. Cl. 58—50 R **10 Claims**

Disclosed is an electronic wristwatch having no moving parts and incorporating a light responsive solid state control circuit for the time display. An electro-optic digital display, either of active or passive elements, is switched off when the ambient light falls below a predetermined level. The active display is also turned off when the light is too bright and both the active and passive displays are provided with a manual override switch for actuating the display under dark conditions at the option of the wearer.

3,747,323

LIGHT CONTROL FOR TIMING DISPLAY

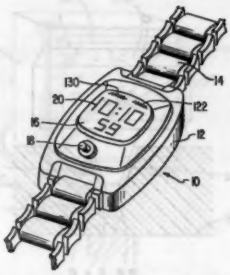
James H. Eckenrode, Millersville, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.

Division of Ser. No. 145,425, May 20, 1971. This application Aug. 3, 1971, Ser. No. 168,611

Int. Cl. G04b *19/30*

U.S. Cl. 58—50 R **10 Claims**

Disclosed is an electronic wristwatch having no moving parts and incorporating a light-responsive solid-state control circuit for the time display. An electro-optic digital display in the form of light-emitting diodes is switched off when the ambient light falls below a predetermined level. The display is



also turned off when the light is too bright and it is provided with a manual override switch for actuating the display under dark conditions at the option of the wearer.

3,747,324

CHRONOGRAPH

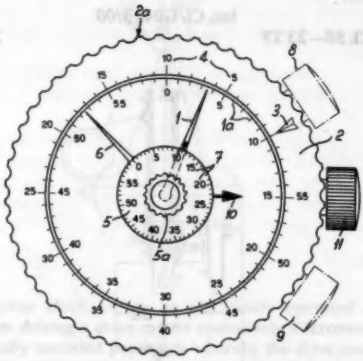
Jean Foufounis, 32, avenue du Leman, Lausanni, Switzerland

Filed May 18, 1971, Ser. No. 144,491

Claims priority, application Switzerland, Apr. 6, 1970, 8517/70

Int. Cl. G04b *19/00*

U.S. Cl. 58—126 B **2 Claims**



A chronograph comprising a minute indicator member, a normal fixed dial which is graduated in minutes, two circular rotary elements which are coaxial with said indicator member and which each have a zero index and a minute graduation which on one of the said elements is retrogressive whereas on the other it is progressive.

3,747,325

PIVOTING DEVICE FOR A HOROLOGY MOVEMENT INCLUDING A SYNTHETIC BEARING

Jean-Claude Schneider, La Chaux-de-Fonds, Switzerland, assignor to Fabrique d'horlogerie Chs. Tissot et fils S.A., Le Locle (Canton of Neuchatel), Switzerland

Filed Oct. 3, 1972, Ser. No. 294,510

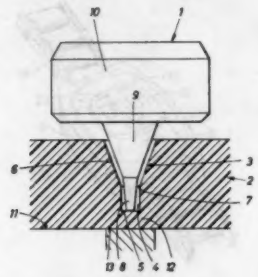
Claims priority, application Switzerland, Oct. 8, 1971, 14737/71

Int. Cl. G04b *13/02, 31/00*

U.S. Cl. 58—140 **12 Claims**

A pivoting device for a wheel-and-pinion used in horology including an elastically deformable, synthetic bearing. A pivot

point penetrates into and presses against the bottom of a bed in the bearing to limit the axial clearance of the wheel-and-pinion. The lateral surface of the bed includes two frustrum-of-a-cone surfaces that are coaxial and of different angles and



that fit together along a circular edge. The lateral surface of the pivot includes a frustrum-of-a-cone surface that extends on either side of the circular edge so that the free annular space between the lateral surfaces of the pivot and the bed is a minimum width at the top of the edge.

3,747,326

CLOCK DRIVE WITH PIEZOELECTRIC TUNING FORK

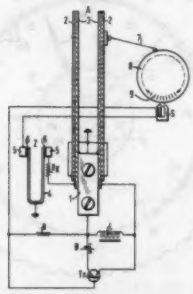
Walter Heywang, Neukeferloh, and Max Guntersdorfer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 13, 1971, Ser. No. 162,227

Claims priority, application Germany, July 17, 1970, P 20 35 587.7

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 TF **23 Claims**



A clock drive in which a piezoelectric tuning fork actuates the driving wheel of a clockwork includes a second tuning fork serving as a narrow-band, frequency-determined time standard coupled with the wheel-actuating tuning fork.

3,747,327

WATCHDIAL STRUCTURE INCORPORATING ELECTRICAL DEVICES

Hideaki Uchiyama, Nagano-ken, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

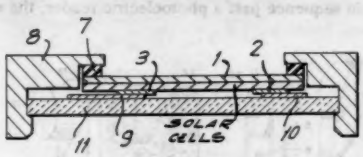
Filed Dec. 27, 1971, Ser. No. 212,449

Claims priority, application Japan, Dec. 29, 1970, 45/128127; Dec. 29, 1970, 45/141704

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 R **5 Claims**

The space required for electrical connections in small wrist watches incorporating electrical devices such as photo-electric elements or display elements is substantially reduced by the use of stressed metal members making firm contact with each other rather than conventional wiring and solder. This



construction simplifies assembly of such watches and makes it easy to break and restore the electrical connections in the event that repair of such timepieces becomes necessary.

3,747,328

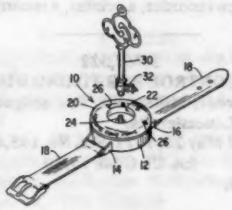
WRIST ALARM FOR CHILDREN

Robert J. Winkler, San Clemente, Calif., assignor to Long Mile Rubber Company, Dallas, Tex.

Filed Dec. 18, 1972, Ser. No. 315,940

Int. Cl. G04b *23/12*

U.S. Cl. 58—57.5 **17 Claims**



A wrist alarm for a child which includes a housing dimensioned to be worn on the wrist of the child. A band is attached to the housing for securing the alarm to the wrist of the child. A timing mechanism is mounted within the housing and includes a spring system operable to be wound by rotation of a shaft. The shaft extends through the upper portion of the housing into a recess. Indicia are provided on the face of the housing which are representative of incremented time intervals. A key is provided for possession by an adult and includes end structure for connection to the shaft. The key may be turned to rotate the shaft to wind the spring system and set the timing mechanism for a predetermined time interval. An alarm is disposed within the housing and is operable by the timing mechanism after the predetermined time interval to alert the child. The system is constructed so that only an authorized adult in possession of the key can set the alarm for the predetermined time interval, thereby preventing tampering with the device by the child.

3,747,329

SWEEP SECOND WATCH MOVEMENT

Jean-Pierre Golay, Tramelan, Switzerland, assignor to Bernard Golay S.A.

Filed May 22, 1972, Ser. No. 255,454

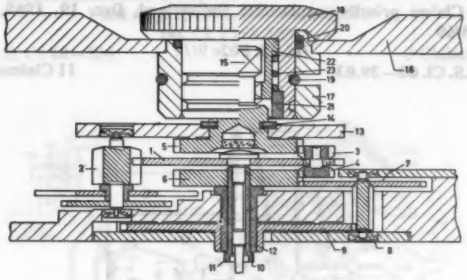
Claims priority, application Switzerland, May 26, 1971, 7656/71

Int. Cl. G04b *33/00, 27/02*

U.S. Cl. 58—59 **5 Claims**

A driven wheel in a timing mechanism is provided with two coaxial, rotationally interdependent planet wheels, one of which drives a gear train for a sweep second hand as well as for minute and hour hands, the other planet wheel being engaged with a normally stationary gear which is selectively driven by a crown wheel positioned externally of the gear cas-

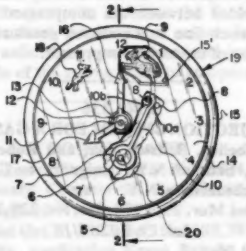
ing. The crown wheel is integral with an axially displaceable tube by means of which male and female members are engaged to enable the crown wheel to displace said normally stationary gear to set the minute and hour hands.



3,747,330
ANIMATED TIME PIECE

Henry Tupone, 1747 57th St., Brooklyn, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,990
Int. Cl. G04b *47/00*
U.S. Cl. 58—125 R 7 Claims



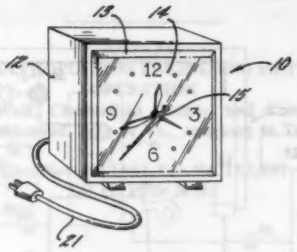
A time piece having animated motion resulting from an annular member mounted slidably around an eccentrically rotatable wheel, the eccentrically mounted wheel being mounted on a shaft rotatable by a time mechanism at a rate of one rotation per minute, in a preferred embodiment there being a rotatable transparent disk concentrically mounted on a shaft and rotatable by the shaft at a rate of one rotation per minute, the transparent disk having thereon an animate-appearing object.

3,747,331
CLOCK WITH TEMPERATURE ALARM MECHANISM

Ernest W. Nyberg, 1802 N. Damen Ave., Chicago, Ill.

Filed Nov. 17, 1971, Ser. No. 199,502
Int. Cl. G04c *21/16*, *47/00*; G07c *46/06*
U.S. Cl. 58—152 R 1 Claim

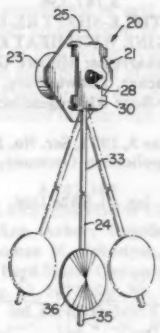
An otherwise conventional electric clock driven by a synchronous motor having an alarm vibrator mounted for vibration in the magnetic field of the motor and normally restrained against vibration by a bi-metal, temperature responsive element which, upon a predetermined increase in ambient temperature, pulls away from the vibrator and allows the alarm to sound.



3,747,332
ELECTRIC PENDULUM CLOCK AND PARTS THEREFOR OR THE LIKE

Edgar E. Marquis, Newtown, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 16, 1971, Ser. No. 134,853
Int. Cl. G04e *3/02*
U.S. Cl. 58—29 17 Claims



An electric clock having an electrically operated clock mechanism driving a drive means operatively interconnected to a pivotally mounted pendulum whereby the drive means is adapted to cause continuous to-and-fro movement of the pendulum as long as the clock mechanism is continuously operating, the drive means comprising an escapement wheel that is driven by the clock mechanism in one direction to impart swinging movement of the pendulum in one direction until the stop means of the pendulum stops movement of the escapement wheel so that a torsion spring can subsequently cause movement of the escapement wheel in its one direction after the pendulum has pivoted a certain amount in its other direction.

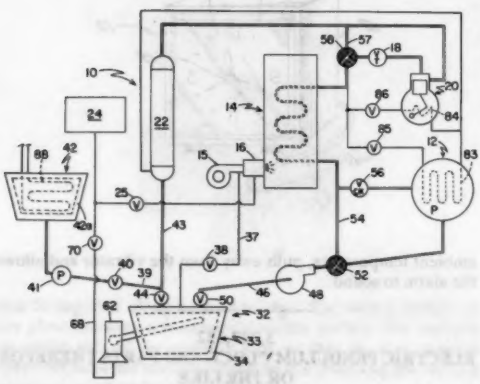
3,747,333
STEAM SYSTEM

Joseph Gerstmann, Sudbury; Richard S. Morse, Wellesley, and Lawrence C. Hoagland, Concord, all of Mass., assignors to Steam Engine Systems, Inc., Newton, Mass.

Filed Jan. 29, 1971, Ser. No. 110,857
Int. Cl. F01k *15/02*, *27/00*
U.S. Cl. 60—1 24 Claims

A winterized steam propulsion system which utilizes water as the working fluid and which comprises a boiler, an ex-

pander, a feed pump, and a condenser has water storage means which provides, substantially immediately on demand, at ambient temperatures below the freezing point of water, a



supply of non-frozen water at least sufficient to charge the boiler, and means for utilizing the steam produced from the non-frozen water supply to place the system in full operation.

3,747,334

COMPACT MULTIPLE-SHAFT RE-EXPANSION GAS TURBINE ENGINE WITH HEAT EXCHANGERS

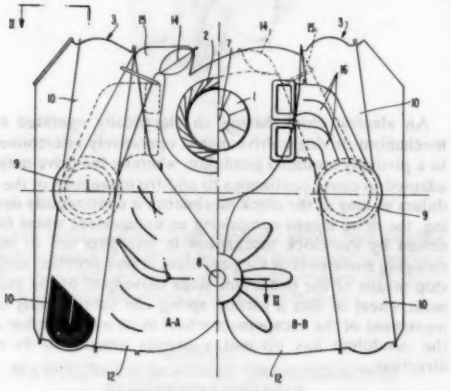
Werner Bruder, Neckarrems; Hubert Grieb, Stuttgart, and Eberhard Tiefenbacher, Ludwigsburg, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed June 3, 1971, Ser. No. 149,542

Claims priority, application Germany, June 3, 1970, P 20 27 221.3

Int. Cl. F02c 1/06

U.S. Cl. 60—39.17 **32 Claims**



A gas turbine engine, especially for vehicles which includes a low pressure compressor unit, a high-pressure compressor unit, a heat-exchanger unit, a combustion chamber unit, a compressor turbine unit and a work turbine unit, in which these units are divided into at least two sections adjacent one another, preferably with parallel axes, whereby the heat-exchanger unit is so arranged that its feed pipe or pipes are disposed parallel to the axes.

3,747,335

METHOD AND APPARATUS FOR CONTROLLING A METALLURGICAL FURNACE TURBO COMPRESSOR

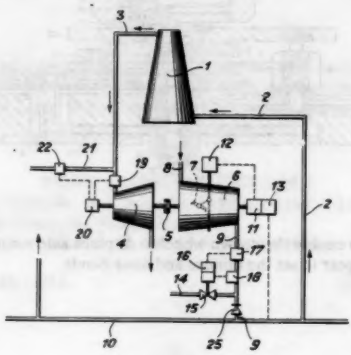
Rene Strub, Winterthur, Switzerland, assignor to Brown-Boveri Sulzer Turbomachinery, Ltd., Zurich, Switzerland

Filed Dec. 9, 1970, Ser. No. 96,348

Claims priority, application Switzerland, Dec. 19, 1969, 83/69

Int. Cl. F02c 9/14

U.S. Cl. 60—39.03 **11 Claims**



The blade angle of the stator blades in the turbocompressor is adjusted in order to control the amount of compressed air delivered by the turbocompressor. The blade angle is adjusted in dependence on the speed of the turbomachinery shaft and the amount of compressed air delivered by the turbocompressor can be divided between the compressed air line to the plant and a branch line to a reduced pressure zone so as to prevent pumping of the turbocompressor.

3,747,336

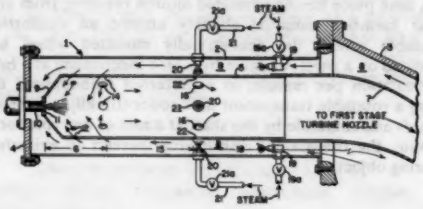
STEAM INJECTION SYSTEM FOR A GAS TURBINE

Norman R. Dibelius, Ballston Spa, and Robert H. Johnson, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,273

Int. Cl. F02c 7/18

U.S. Cl. 60—39.55 **4 Claims**



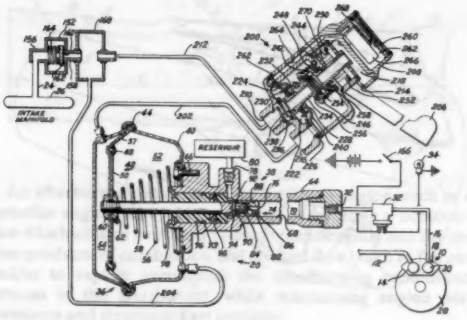
Steam injection nozzles for augmenting the power output of a gas turbine are arranged to selectively inject steam into the combustion liner downstream of the combustion reaction zone. The steam injection nozzles are spaced from but aligned with selected air holes in the liner, so that the injected steam restricts entry of air into the liner when the steam is on. Air is admitted through the holes into the liner when the steam is off, thus maintaining the proper pressure drop across the liner in either wet or dry operating mode.

3,747,337

SPRING BRAKE SYSTEM WITH A CONSTANT FORCE SINGLE STROKE PUMPING MEANS

Delbert J. Gardner; Louis P. Rossigno, and Leo H. McCormick, Jr., all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Aug. 2, 1971, Ser. No. 168,226
Int. Cl. F15b 7/00
U.S. Cl. 60—534 3 Claims



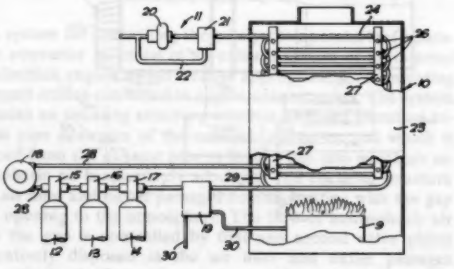
A power brake system for a parking brake having a hydraulically operated spring brake with a manual control. A single stroke pump responsive to a pressure differential created by the flow of a first and second fluid under pressure regulated by the manual control is capable of pressurizing hydraulic fluid. This pressurized hydraulic fluid is adapted to overcome the resiliency of the spring brakes to maintain the parking brake in a released position. A flow control device adjacent the manual control will assure that a constant differential pressure is maintained in the pump to stabilize the force of the pressurized hydraulic fluid. An indicator responsive to the pressure of the hydraulic fluid provides a visual indication of the operational mode of the spring brake to an operator.

3,747,338

POWER PLANT

Ernest Thomas James Tapp, Fleet, Aldershot, England, assignor to County Commercial Cars Limited, Aldershot, Hempshire, England

Filed Oct. 1, 1971, Ser. No. 185,781
Claims priority, application Great Britain, Oct. 6, 1970, 47,547/70
Int. Cl. F01b 29/12, 29/02
U.S. Cl. 60—69 13 Claims



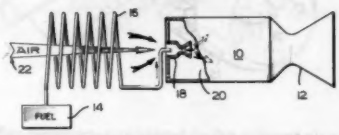
The invention consists of a power plant comprising a fluid heater with an inlet and an outlet for the fluid, at least one piston and cylinder combination having an associated inlet valve for admitting fluid to the cylinder and, means to connect the outlet with the inlet valve, in which there is a chamber around a part of the valve through which chamber fluid passes to the cylinder and there is means to direct heated fluid from the chamber back to the heater to provide a continuous circuit.

3,747,339

REACTION PROPULSION ENGINE AND METHOD OF OPERATION

Robert L. Wolf, Chesterfield County, and Christopher J. Cowlin, Richmond, both of Va., assignors to Texaco, Inc., New York, N.Y.

Filed Nov. 13, 1961, Ser. No. 152,097
Int. Cl. F02k 11/02
U.S. Cl. 60—206 5 Claims



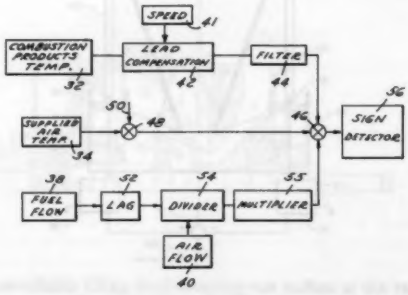
1. The method of operating an air-breathing propulsion system comprising transferring a portion of energy from the ram air of the system to the fuel supply by indirect heat exchange between the ram air and the fuel at the ram air intake into the system, utilizing at least a portion of the heat transferred to the fuel to further compress at least a portion of the ram air prior to combustion of said portion of the fuel, controlling said further compression of the ram air by bypassing with respect to said further compression a portion of the ram air heated fuel, burning at least a portion of the fuel in the fuel cooled ram air, and expanding the combustion products and uncombusted fuel through at least one reaction expansion nozzle.

3,747,340

FLAME SENSING SYSTEM FOR A TURBINE ENGINE

James E. Fenton, Ann Arbor; Rogelio G. Samson, Birmingham, and Thomas M. Sebestyen, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 12, 1971, Ser. No. 171,228
Int. Cl. F02k 3/00
U.S. Cl. 60—223 9 Claims



The temperature difference between the combustion products leaving a combustion chamber and the air entering the combustion chamber is compared with a reference value that is based on the mass ratio of the fuel and air supplied to the combustion chamber. A positive output signal indicates the presence of a flame while a negative output signal indicates a flameout. The inexpensive system operates effectively throughout all phases of engine operation.

3,747,341

FANS

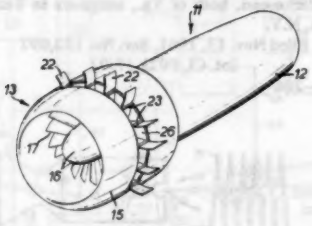
David George Michael Davis, Cheltenham, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed Dec. 17, 1971, Ser. No. 209,196

Claims priority, application Great Britain, Jan. 2, 1971, 272/71

Int. Cl. F02k 3/02; F02b 25/02

U.S. Cl. 60—226 A 15 Claims



A fan assembly for a gas turbine engine of the ducted-fan by-pass type includes a non-rotative by-pass duct and a single-stage fan mounted for rotation by the engine within the by-pass duct. The fan has flow-varying blading capable of movement from positive pitch into negative pitch whereby the direction of flow of air in the duct is reversed. The duct has means located downstream with respect to the fan blading when in positive pitch and operative when the fan blading is in negative pitch to increase the amount of air introduced to the duct.

3,747,342

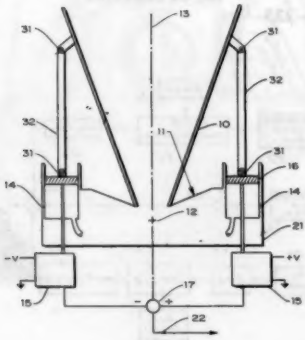
CONTROL SYSTEM FOR FLEXIBLE SEAL MOVABLE NOZZLE

Lawrence E. Kapinos, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1970, Ser. No. 90,592

Int. Cl. F02k 1/24, 1/24

U.S. Cl. 60—232 6 Claims



A control system for a flexible seal movable nozzle in which movement of the nozzle is effected by pairs of hydraulic actuators, one pair in the pitch plane and one pair in the yaw plane. Each of the paired actuators are connected to identical linear variable differential transducers or potentiometers which measure actuator displacements to provide a signal as loop feedback.

3,747,343

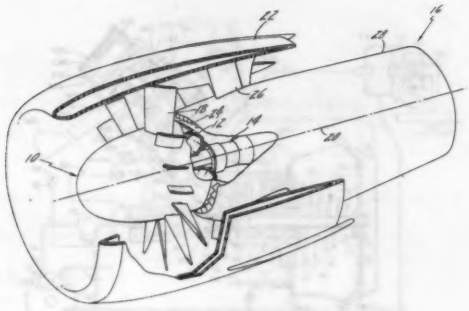
LOW NOISE PROP-FAN

George Rosen, West Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 10, 1972, Ser. No. 225,186

Int. Cl. F02k 3/04

U.S. Cl. 60—226 R 10 Claims



An air propulsor having either a fixed or a variable pitch fan with blade loadings selected from a range intermediate between aircraft propeller and fan engine designs is configured so as to retain high takeoff thrust and good high-speed efficiency while providing a large reduction in noise generation. Noise is abated at its source by reducing rotative speed of the fan blades, uniquely selecting the number of stator vanes relative to the fan, and judiciously spacing the stator vanes relative to the fan and relative to each other.

3,747,344

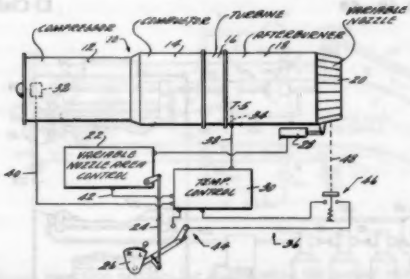
VARIABLE NOZZLE AREA CONTROL SYSTEM

Russell W. Porter, and John C. Riley, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed July 20, 1970, Ser. No. 56,367

Int. Cl. F02k 1/18

U.S. Cl. 60—242 4 Claims



A control system for a jet engine variable area nozzle includes means for selectively generating a first or a second temperature reference signal in response to engine throttle lever position and nozzle area for effective control of engine operating temperatures and to enhance maximum augmented engine thrust.

3,747,345

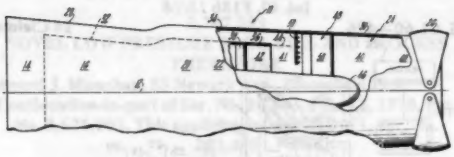
SHORTENED AFTERBURNER CONSTRUCTION FOR TURBINE ENGINE

Stanley J. Markowski, East Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 84,087, Oct. 26, 1970. This application July 24, 1972, Ser. No. 274,784

Int. Cl. F02k 3/10

U.S. Cl. 60—261 20 Claims



An afterburner construction for a turbine engine, such as a turbofan engine, which is foreshortened by using a construction which utilizes swirl flow phenomena to rapidly mix the engine products of combustion and coolant flow, such as fan air, and/or to rapidly accomplish the afterburning combustion process in the afterburner, while maintaining engine performance and structural part integrity.

3,747,346

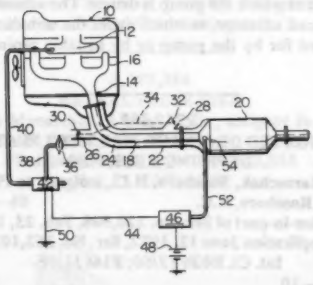
TEMPERATURE CONTROL SYSTEM FOR CATALYTIC CONVERTER

Michio Onoda, Yokohama; Saburo Usui; Tutomu Simizume, both of Yokosuka, and Mitsuru Taguchi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Apr. 17, 1972, Ser. No. 244,550

Int. Cl. F01n 3/14

U.S. Cl. 60—286 1 Claim



A system for controlling the catalyst temperature of a catalytic converter mounted in an exhaust system of an internal combustion engine within a range appropriate for eliminating nitrogen oxides contained in engine exhaust gases. The system includes an encasing structure which is disposed about an exhaust pipe upstream of the catalytic converter and which is spaced from the exhaust pipe to form a gap into which an atmospheric air is selectively admitted. The encasing structure has air inlet and outlet passages communicating with the gap and opening to the atmosphere. The flow of atmospheric air into the gap is controlled by first and second valve plates operatively disposed in the air inlet and outlet passages respectively, the first and second valve plates being controlled by a control means comprising a diaphragm unit communicating with an intake manifold of the engine, a solenoid valve for controlling the fluid communication between the diaphragm unit and the intake manifold, and a temperature sensitive switch responsive to the catalyst temperature for controlling the solenoid valve.

3,747,347

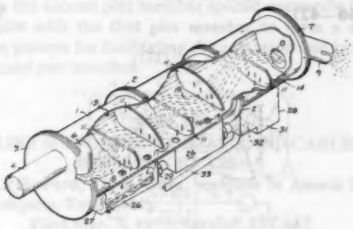
POLLUTION PREVENTING EXHAUST DEVICE

Samuel Ciraolo, 1335 Fiori Ave., Modesto, Calif.

Filed Apr. 12, 1971, Ser. No. 133,157

Int. Cl. F01n 3/02; F02b 75/10

U.S. Cl. 60—309 7 Claims



A muffler-separator connected to the exhaust pipe of an engine includes a tubular elongated casing divided into chambers by baffles extended alternately from opposite walls of the casing leaving a space at the free edge of each baffle for the passage of products of combustion from chamber to chamber; the baffles are parallel and are inclined toward the intake end of the casing; the volume of the chamber at the intake end is about three times the combined volume of all the combustion chambers of the engine; the volume in each intermediate chamber is about the same as that of a single combustion chamber in the engine; the volume of the chambers nearer the exhaust end of the casing increases gradually; a trap underneath the casing collects trapped moisture which can be reintroduced into the engine.

3,747,348

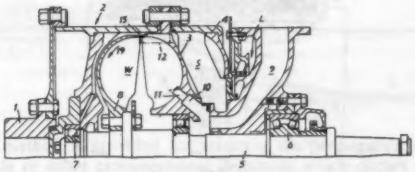
HYDRODYNAMIC POWER DRIVES

John Bilton, Walton-on-Thames, England, assignor to Fluidrive Engineering Company Limited, Isleworth, Middlesex, England

Filed Feb. 16, 1972, Ser. No. 226,776

Int. Cl. F16d 31/10

U.S. Cl. 60—351 9 Claims

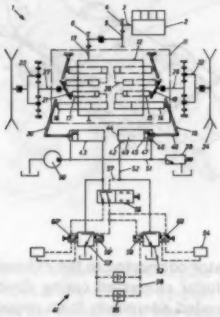


A controllable filling fluid coupling has outlets at the radially outer part of its working circuit periphery for the removal of a cooling flow of working liquid fed into the working circuit when the input is shut down and the output is rotated by the load which is driven from another source of power. The outlets have collecting scoops which face into the vortex which is set up under these conditions. Under normal driving conditions, the liquid in the vortex travels in the opposite direction, i.e. from the input member to the output member at the outer periphery and is not intercepted by the collecting scoops.

3,747,349
HYDROSTATIC TRANSMISSION

Heinz Weiss, Langenargen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Sept. 27, 1971, Ser. No. 183,890
Claims priority, application Germany, Oct. 3, 1970, P 20 48 637.7
Int. Cl. F16h *39/46*
U.S. Cl. 60—421 9 Claims

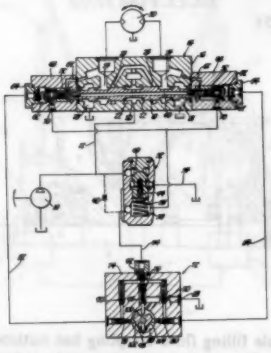


The strokes of a pair of pump pistons are continuously varied by stroke control discs during rotation of a casing mounting the pump pistons as well as motor pistons hydraulically coupled thereto to form a hydrostatic power path superimposed on a mechanical power path established during rotation of the casing by the motor pistons reacting against inclined discs connected to output shafts. The inclination of the pump stroke control discs are independently controlled by a servo arrangement in response to various control influences.

3,747,350
POWER TRANSMISSION

Donald J. West, Warren, and William J. Martin, II, Milford, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Feb. 3, 1972, Ser. No. 223,161
Int. Cl. F15b *9/14*
U.S. Cl. 60—459 7 Claims

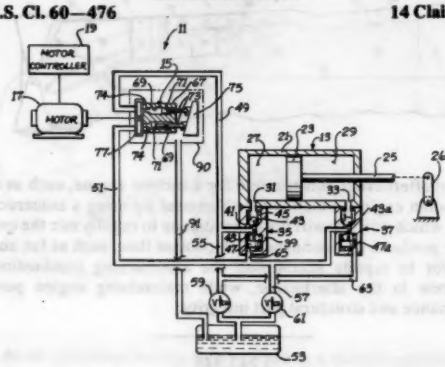


A hydraulic power transmission for driving and braking high inertia loads, such as the swing mechanism of a power shovel, uses a directional valve to control flow between the pressure source and the motor and a pilot operated relief valve to regulate the pressure in the supply. A triplex controller modulates the pilot pressure applied to the relief valve and simultaneously that applied to variably shift the directional valve. This enables an operator to modulate the pressure applied either in a driving or a braking direction to the fluid motor. When in the braking mode, the supply pressure is maintained at a low level only sufficient to charge the motor inlet while the motor decelerates.

3,747,351
HYDRAULIC SYSTEM

William D. Wilkerson, Santa Ana, and A. P. Henry, Irvine, both of Calif., assignors to Bertea Corporation, Irvine, Calif.

Filed Oct. 22, 1971, Ser. No. 191,912
Int. Cl. F15b *15/18*
U.S. Cl. 60—476 14 Claims

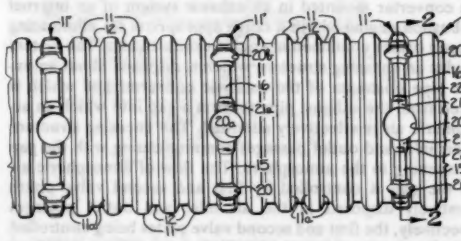


A hydraulic system comprising an actuator including a housing and a piston movable in the housing, a reversible, variable speed pump, and conduits for connecting the pump to both sides of the piston so that the pump can pump hydraulic fluid from one side of the piston to the other. The pump is driven by a reversible, variable speed drive with the direction of piston movement being a function of the direction in which the pump is driven. The rate of piston movement is a function of the speed at which the pump is driven. The actuator may be an unbalanced actuator, in which event the unbalance can be compensated for by the pump or by suitable piping connections.

3,747,352
CORRUGATED DRAINAGE PIPE WITH PLATEAUS DEFINING RECESSES

Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc., Roseboro, N.C.

Continuation-in-part of Ser. No. 228,508, Feb. 23, 1972. This application June 12, 1972, Ser. No. 262,103
Int. Cl. E02b *13/00*; F16l *11/06*
U.S. Cl. 61—10 14 Claims



A resilient plastic drainage pipe of lightweight construction having spaced apart successively arranged ribs with interconnecting valley portions therebetween defining corrugations along the periphery of the pipe, the majority of the ribs being uninterrupted and arranged in spaced groups with an inter-

rupted rib between adjacent groups, each interrupted rib comprising a set of three circularly arranged spaced apart arcuate rib segments correspondingly arranged throughout the pipe, one rib segment of each set being substantially longer than the other two rib segments and having an arcuate extent of at least 180 degrees, recessed wall portions extending between and interconnecting adjacent arcuate rib segments and positioned at a level intermediate that of the peripheries of the ribs and valley portions, and a drainage hole provided in each recessed wall portion.

3,747,353

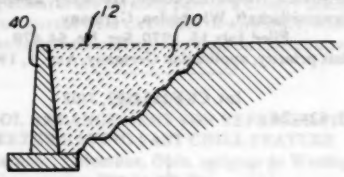
NOVEL LOW PRESSURE BACK-FILL AND PROCESS THEREFORE

Edward J. Monahan, 85 Newark Ave., Bloomfield, N.J.

Continuation-in-part of Ser. No. 10,843, Feb. 12, 1970, Pat. No. 3,626,702. This application Dec. 13, 1971, Ser. No. 207,400

Int. Cl. E02d *29/00*

U.S. Cl. 61—39 **11 Claims**



There is provided a novel form of back-fill for vertical retaining walls and a method of producing the same.

The novel form of back-fill comprises a layer of moderately rigid, synthetic, polymeric foam located between the interface of a retaining wall and the soil which it is intended to retain. This plastic layer replaces sand or soil customarily used for this purpose. The novel back-fill makes possible the use of retaining walls of considerably lower strength than have been needed heretofore. The novel back-fill also permits easier drainage of the space behind the retaining wall.

3,747,354

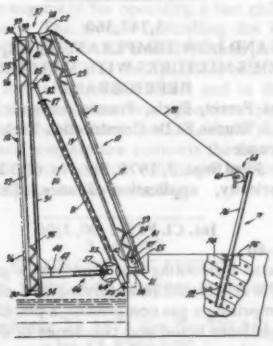
RETRACTABLE PIER

Ray Marvin Macomber, Albion, Mich., assignor to Edwin A. Torrey, Albion, Mich., a part interest

Filed June 16, 1971, Ser. No. 153,555

Int. Cl. E02b *3/20*

U.S. Cl. 61—48 **11 Claims**



A portable pier or landing dock is provided for use, for example at small lakes and private cottages, comprising a pair of pier members hingedly affixed to each other with the end of one pier member hingedly mounted with respect to ground. A cable is connected to the distal end of the latter hinged pier member and operated by winding on a winch mounted on a dead anchor mounted in the ground. In a preferred embodiment an adjustable leg is provided at the distal end of the second pier member having a water buoyant floatable roller at the end thereof. Additionally, in an improved embodiment, a thrust rod is provided pivotally mounted at one end at a point fixed with respect to the ground near the pivotal point of the first pier member, and pivotally connected at the other end to a point on the second pier member spaced outwardly from its hinged joint with the first pier member to form a suitable geometric pattern for facilitating the extension and launching of the second pier member.

3,747,355

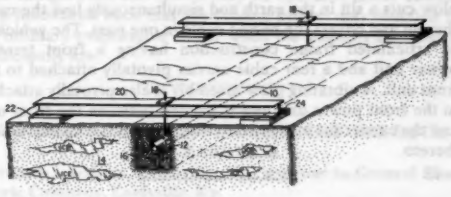
PIPELINE SUPPORTED BY BEAMS AND CABLES IN PERMAFROST AREAS

George C. Howard, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed Mar. 3, 1972, Ser. No. 231,643

Int. Cl. F16l *1/00*; B63b *35/02*; F16l *3/00*

U.S. Cl. 61—72.1 **3 Claims**



This invention relates to supporting a pipeline buried in a permafrost area. A trench is dug and the pipe is buried in the usual manner, but the pipe is supported in the trench by a beam resting on the surface perpendicular to the trench with cables running from the pipe to the beam. The ends of the support beam may rest on a berm, pad, or float.

3,747,356

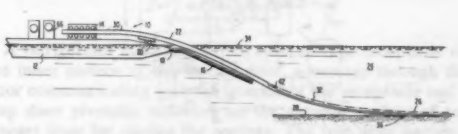
METHOD OF ARRESTING THE PROPAGATION OF A BUCKLE IN A PIPELINE

Joe C. Lochridge, and Tony Leon Gibson, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Apr. 7, 1972, Ser. No. 242,017

Int. Cl. F16l *1/00*

U.S. Cl. 61—72.3 **8 Claims**

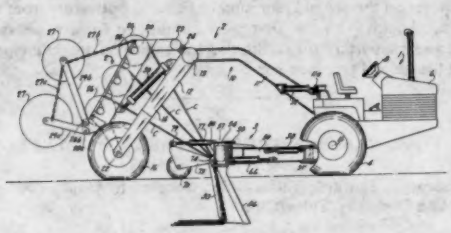


A method is provided for arresting the propagation of a buckle or other cross-sectional deformity which occurs in a pipeline during underwater pipeline laying operations. A substantially rigid buckle arresting means of sufficient strength to withstand the forces tending to propagate a buckle along the longitudinal axis of a pipeline is introduced into the interior of a portion of pipeline and in the event that a buckle occurs, the buckle arresting means engages with the buckle propagating therealong so as to arrest longitudinal propagation of that buckle. The buckle arresting means can remain engaged with the buckle and thereby prevent further propagation until repair operations are commenced. The buckle or non-buckle condition of the pipeline may be continuously monitored utilizing the buckle arresting means as a buckle detecting means.

3,747,357
VEHICLE FOR UNDERGROUND INSTALLATION OF FLEXIBLE UTILITY LINES AND THE LIKE

Robert W. Erickson, and John F. Lindell, both of Newton, Iowa, assignors to Koehring Company, Milwaukee, Wis.

Filed Mar. 20, 1972, Ser. No. 236,093
Int. Cl. E02f 5/00; F16l 1/00
U.S. Cl. 61—72.6 14 Claims

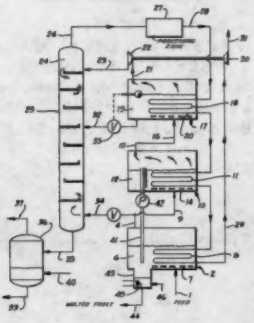


A self-propelled vehicle for underground installation of flexible utility lines or the like wherein a vibrating, vertical plow cuts a slit in the earth and simultaneously lays the cable therein and covers the buried cable in one pass. The vehicle is of articulated frame construction having a front tractive power unit and a rear cable carrier pivotally attached to the front unit. A vibrating plow assembly is also pivotally attached to the front power unit and is located between the front unit and the carrier for independent vertical and lateral movement thereto.

3,747,358
CRYOGENIC PROCESS

Judson S. Swearingen, 2235 Carmelina Avenue, Los Angeles, Calif.

Filed May 1, 1968, Ser. No. 725,776
Int. Cl. F25j 1/00, 3/02, 3/04
U.S. Cl. 62—12 12 Claims



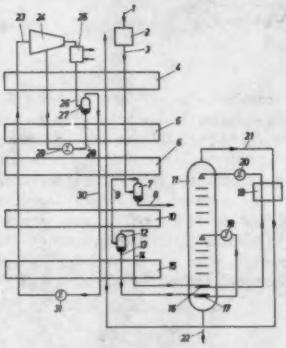
A process for the low temperature separation of pressurized raw gas into a condensed portion and a residue gas. Pressurized feed gas which may contain a frost forming constituent is chilled by passing it through a liquid medium in a series of chill chambers. The chambers are maintained at successively colder temperatures by refrigerant coils which are in series and are cooled by the returning chilled stream of residue gas. Any frost forming will be at the interfaces between the gas and liquid medium thereby preventing accumulation of frost on the heat exchange equipment.

The uncondensed gas from the coldest chill chamber is fed into a turboexpander which expands the uncondensed gas further chilling it and thereby condensing some of it. The turboexpander discharge is fed into a liquid disengaging zone at the top of a fractionating column where the condensed liquid is disengaged. The residue gas is discharged into the refrigerant coil system where its refrigeration content is recovered. The disengaged liquid acts as the top tray feed of the fractionating column. Condensed liquid from the chill chambers is fed into the fractionating column as a side feed. In addition, a warm stream of feed gas is fed into the bottom. This gas stream acts as a stripping vapor warming the downflowing product liquid to strip it of its more volatile constituents while at the same time being cooled by the colder liquid. Accordingly, the refrigeration in the product liquid is recovered. Again any frost formed will be on the surface of the liquid and carried down with the liquid. To assure that there will be a liquid medium in the warmer chill chamber, overflows are provided from colder chambers. Means are provided to collect and reject the dispersed frost.

3,747,359
GAS LIQUEFACTION BY A FRACTIONALLY CONDENSED REFRIGERANT

Martin Streich, Nieder-Eschbach, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed July 13, 1970, Ser. No. 54,478
Claims priority, application Germany, Aug. 1, 1969, P 19 39 114.1
Int. Cl. F25j 1/02, 3/02
U.S. Cl. 62—24 4 Claims



A gas stream is liquefied by indirect heat exchange with a multi-component refrigerant in a closed cooling cycle. The refrigerant is fractionally condensed and the fractions are separately evaporated in the closed cycle to cool and liquefy the gas stream.

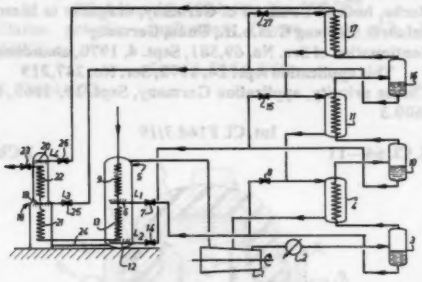
3,747,360
COOLING AND LOW TEMPERATURE LIQUEFACTION OF GASEOUS MIXTURES WITH MULTICOMPONENT REFRIGERANT

Jean Charles Perret, Paris, France, assignor to Compagnie Francaise D'Etudes Et De Construction Technip, Rueil-Malmaison, France

Filed Sept. 3, 1970, Ser. No. 69,327
Claims priority, application France, Feb. 12, 1970, 7004963
Int. Cl. F25j 1/00, 5/00
U.S. Cl. 62—40 6 Claims

An apparatus for cooling and liquefying a gaseous mixture by means of a refrigerant fluid formed of a plurality of constituents, comprising a gas compressor, a plurality of tanks for separating gas from liquid and two series of counter current exchangers, said exchangers, for the cooling and liquefaction, being placed at increasing heights so as to provide for a circulation by gravity, along the various exchangers, of the refrigerant liquid injected at the head of each exchanger, and its mixture with the refrigerant gases, said refrigerant gases being liquefied by successive fractions at lower and lower tem-

peratures in a first one of said two series of exchangers and used for cooling and liquefying the gaseous mixture in the other one of said series of exchangers, wherein in at least one



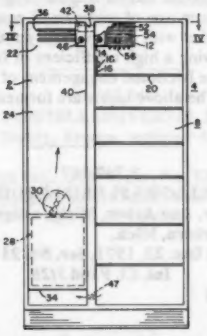
series of exchangers at least the exchangers working at the two lowest temperatures are forming part of a unitary assembly in which the refrigerant fluid circulates downwardly, whereas in the other exchangers the refrigerant fluid circulates upwardly.

3,747,361

CONTROL ARRANGEMENT FOR REFRIGERATOR-FREEZER HAVING FAST CHILL FEATURE

Philip F. Harbour, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 5, 1971, Ser. No. 186,617
Int. Cl. F25d *17/00*
U.S. Cl. 62—157 **5 Claims**



A control arrangement for operating a fast chill fan in the refrigerator space. The switch controlling the fan may be manually set to one position for a selected time period to energize the fan independently of the operation of the main cooling system of the refrigerator-freezer, and in the alternate position to which the switch returns upon the expiration of the selected time period a thermostatic switch responsive to refrigerator space temperature connects the fast chill fan for operation concurrently with the refrigerant compressor when the refrigerator space demands cooling.

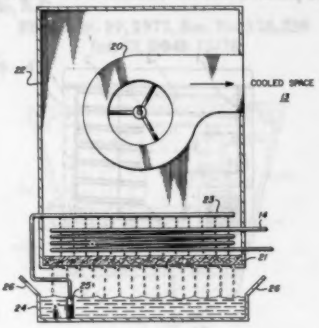
3,747,362

SPACE COOLING SYSTEM

John F. Mercer, Globe, Ariz., assignor to George W. Leach, Globe, Ariz., a part interest

Filed Mar. 29, 1972, Ser. No. 239,261
Int. Cl. F28d *3/00*
U.S. Cl. 62—171 **3 Claims**

In order to combine the advantages of the well known evaporative cooler with the advantages of the equally well known conventional refrigeration system, the water recirculated over the pads of the cooler is refrigerated sufficiently to dehumidify the outside air drawn through the cooling pads. The evaporator coils may be placed directly in the cooler reservoir, in the return water flow path between the pads and the reservoir, or in the supply water path above a single pad.



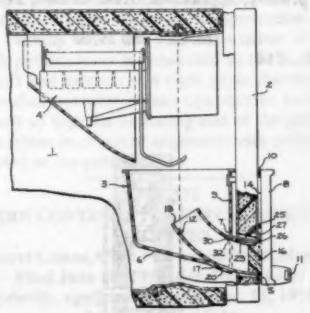
The refrigeration sub-system may be operated under control of a humidistat such that the cooling system may function as an ordinary evaporative cooler when the ambient humidity is sufficiently low.

3,747,363

REFRIGERATOR INCLUDING THROUGH-THE-DOOR ICE SERVICE

Bernard J. Grimm, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 30, 1972, Ser. No. 257,701
Int. Cl. F25c *5/18*
U.S. Cl. 62—377 **9 Claims**



A refrigerator including an ice cube storage receptacle on the inner surface of the freezer door, a passage through the door communicating with the interior of the receptacle and a trap door pivotally mounted on the exterior surface of the freezer door for closing the passage. The trap door carries a delivery tube extending through the passage for picking up ice pieces from the receptacle and delivering the ice pieces to the exterior of the freezer door when the trap door is opened.

3,747,364

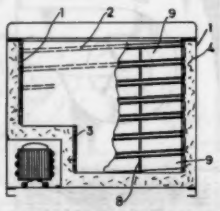
NEW FREEZING CHAMBER WITH REFRIGERATION STORAGE

Nikolaus Laing, Hefener Weg 35-37, 7141 Aldingen bei Stuttgart, Germany

Filed July 12, 1971, Ser. No. 161,738
Claims priority, application Austria, Apr. 14, 1970, 637970
Int. Cl. F25d *11/00*
U.S. Cl. 62—430 **14 Claims**

A freezing chest or freezing shelf comprising a compressor, heat exchangers and a heat storage arrangement with a heat

storage material having a crystallization temperature above the temperature of the evaporator and below the maximum permissible temperature of the goods to be refrigerated. The heat storage material is arranged in containers formed from thin walled plastics, and the containers are disposed between



the container of the goods to be refrigerated and the insulating layer, and are in contact with the wall of the former over approximately half the total surface. Further, the containers of the heat storage material have recesses for the evaporator tubes which are equally in contact with the wall of the container of the goods.

3,747,365

CRYOGENIC COOLING APPARATUS

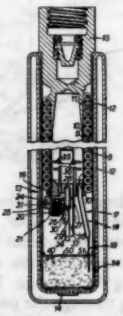
Kenneth Edmund Nicholds, Redditch, Worcestershire, England, assignor to The Hymatic Engineering Company Limited, Redditch, England

Filed Feb. 17, 1971, Ser. No. 116,150

Claims priority, application Great Britain, Feb. 18, 1970, 7,810/70

Int. Cl. F25b *19/00*

U.S. Cl. 62—514 **1 Claim**



A cryogenic cooler includes a heat exchanger having a helically wound finned tube of which the interior forms one path in which refrigerant gas from a supply under pressure is supplied to a Joule Thomson expansion nozzle, whence the low pressure gas returns through the other path outside the helical tube, and inner container of metal in which the heat exchanger and nozzle are permanently secured, a Dewar flask in which the inner container is removably fitted, and, between the outside surface of the container and an opposed inside surface of the flask, a fluid or paste heat transfer material of high heat conductivity.

3,747,366

FLEXIBLE COUPLING HAVING FRICTION-INCREASING MEANS

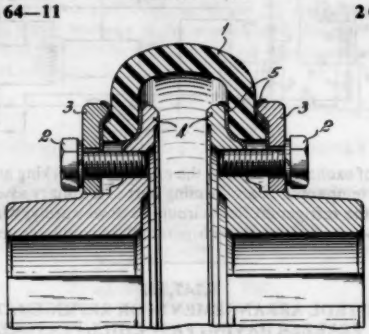
Werner Ruggen, Holzwickede; Herbert Krellmann, and Helmut Bache, both of Unna, all of Germany, assignors to Maschinenfabrik Stromag G.m.b.H., Unna, Germany

Continuation of Ser. No. 69,581, Sept. 4, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 247,219

Claims priority, application Germany, Sept. 15, 1969, P 19 46 600.3

Int. Cl. F16d *3/19*

U.S. Cl. 64—11 **2 Claims**



A flexible coupling including a pair of juxtaposed coupling members and a flexible torque-transmitting member for transmitting torques from one of said pair of coupling members to the other is provided with intermediate auxiliary torque-transmitting layers having a high coefficient of friction to increase the strength of the frictional engagement of cooperating parts of the coupling. The above layers are formed by spray deposits of metal particles.

3,747,367

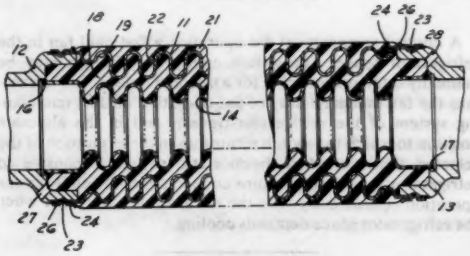
BELLOWS FLEXIBLE JOINT

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1971, Ser. No. 211,494

Int. Cl. F16d *3/28*

U.S. Cl. 64—11 B **7 Claims**

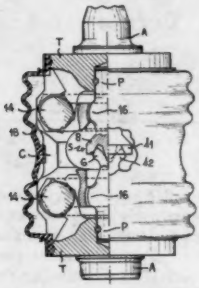


A flexible joint for transferring torque and rotary motion which includes a first cylindrical bellows interconnecting and secured to a driving member and a driven member. A second cylindrical member is received within the bellows and is engagable with but unsecured to the driving member and the driven member. An injected elastomeric compound is received within the first cylindrical bellows and about the second cylindrical member and functions to reduce torsionally induced stresses within the bellows.

3,747,368
DOUBLE UNIVERSAL JOINT

Gerard Morin, Bondy, France, assignor to Societe Anonyme DBA

Filed Dec. 10, 1971, Ser. No. 177,752
Claims priority, application France, Sept. 11, 1970, 7033025
Int. Cl. F16d 3/30
U.S. Cl. 64—21 2 Claims

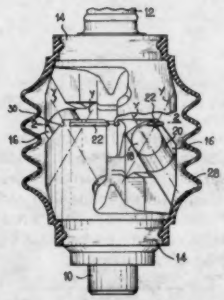


Double universal joint in which the conventional slidable ball and socket joint embodying the bending centre of the joint is replaced by an articulation comprising a spherical gearing. This articulation allows the bending centre to remain equally distant from each end of the joint irrespective of the bending angle, thus giving a perfect constant-velocity feature to a double Cardan joint. The articulation can be inexpensively manufactured by cold forging.

3,747,369
EXTENSIBLE UNIVERSAL JOINT

Gerard Morin, Bondy, France, assignor to Societe Anonyme D.B.A.

Filed Feb. 3, 1972, Ser. No. 223,275
Claims priority, application France, Feb. 11, 1971, 7104604
Int. Cl. F16d 3/30
U.S. Cl. 64—21 2 Claims

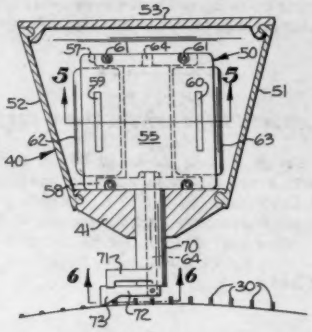


An extensible universal joint of the type comprising two interlaced heads each having arms, and a plurality of balls each located between each pair of adjacent arms, the balls being guided in races which are formed in confronting surfaces of the arms and extend to the end of the arms. A clip secured at the end of each arm comprises portions protruding on the surface of the races formed in this arm to prevent accidental dislocation of the joint.

3,747,370
PATTERN JACK ACTUATOR MEANS FOR CIRCULAR KNITTING MACHINES

Arthur L. DeBolt, Artesia, and Walter A. Liebermann, Altadena, both of Calif., assignors to Northrop Carolina, Inc., Asheville, N.C.

Filed Mar. 19, 1971, Ser. No. 126,239
Int. Cl. D04b 15/78
U.S. Cl. 66—42 4 Claims

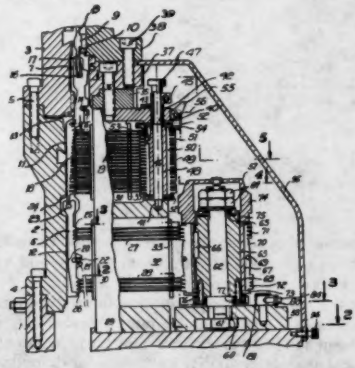


The actuator means is adapted for use with relatively large multi-feed circular knitting machines of the type equipped with pattern jacks and operates in advance of each knitting station to select certain needles to form stitch loops and other needles to remain below the stitch forming level and to form floats in the fabric. An easily removable and replaceable compact pattern unit is provided at each knitting station and includes vertically aligned and closely spaced selector devices which operate on the pattern butts at different levels on the pattern jacks. Each selector device includes a control shaft supported perpendicular to the axis of rotation of the knitting cylinder and for limited rotational reciprocation along a line extending radially from the axis of rotation of the needle cylinder. A pattern lever is connected to the inner end of the control shaft and extends at a right angle therefrom. Electrically controlled actuator means operates to reciprocate the control shaft so that the operating end of the pattern lever is positioned either in or out of alignment with pattern butts at a selected level on the pattern jacks.

3,747,371
PATTERN CONTROLS FOR CIRCULAR KN[illegible]TING MACHINES

Jorge Rectoret Comas, Calle San-Augustin 59, Mataro, Spain

Filed June 18, 1971, Ser. No. 154,402
Claims priority, application Spain, Sept. 11, 1970, 383923
Int. Cl. D04b 15/74
U.S. Cl. 66—50 B 6 Claims



Pattern controls for circular knitting machines. The needle cylinder has in each of its grooves a lifting jack beneath which

there is an upper tiltable selecting jack, and situated beneath the upper selecting jack is a lower selecting jack, this series of jacks in each groove being pivotally connected at their ends so that through tilting of the selecting jacks the lifting jack can be moved to or from an operating position. The upper tiltable selecting jack has a positive-selection butt to be engaged by a cam for swinging the lifting jack to its operating position, while the lower tiltable selecting jack has both a positive and a negative selection butt, both of which can be engaged by selecting cams for bringing about movement of the lifting jack either to its operating position or away from its operating position.

3,747,372

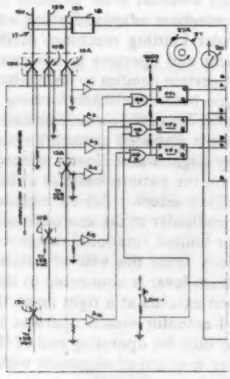
RUNNER CHECKER APPARATUS FOR WARP KNITTING MACHINES

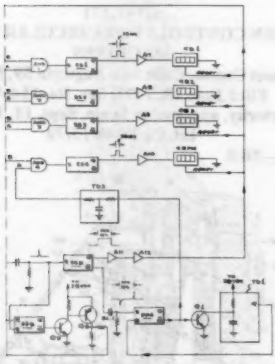
Lawrence Creigh Nickell; Raymond Baines Fertig, both of Ronceverte; Ernest Eggleston, Alderson, and Samuel Eugene Mitchell, Lewisburgh, all of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Filed Apr. 19, 1972, Ser. No. 245,500

Int. Cl. D04b *23/00, 27/00*

U.S. Cl. 66—86 A **21 Claims**





A runner checker apparatus for use with a knitting machine which has a plurality of warp beam sections and a main drive shaft, the runner checker apparatus including a device monitoring the main drive shaft rotation to produce course counting pulses at a selected pulse rate, a device for marking the yarn being fed from the beam sections with a detectable mark, start and stop detectors for each yarn for detecting when the mark passes selected start and stop measuring stations, and electronic circuitry for producing a counter display providing a readout which indicates the number of courses per preselected runner length based upon detection of the passage of the mark through the start and stop detecting stations.

3,747,373

NEEDLE MOUNTING ARRANGEMENT

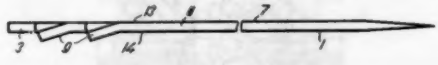
Jaromir Sedlecky; Josef Matejka; Bohumil Milichovsky, and Olrich Eisner, all of Prague, Czechoslovakia, assignors to Statni Vyzkumny Ustav Textilni, Liberec, Czechoslovakia

Filed Apr. 7, 1971, Ser. No. 132,010

Claims priority, application Czechoslovakia, Apr. 10, 1970, 241,070

Int. Cl. D04b *35/04*

U.S. Cl. 66—120 **12 Claims**



Stitch bonding needles have slanted lateral anchoring portions projecting transversely from the respective shank end portion and being embedded in cast material filling a cavity in a holding member so that the needles are reliably secured against the forces acting on the needles during the piercing and retraction motions of the needles. The rear end of the hollow shank end portion of the needle is located outside of the cavity so that the cast material cannot enter the guideway for the latch slide part of the needle.

3,747,374

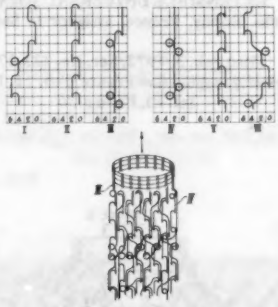
STRETCHABLE TUBULAR FABRIC

Robert B. Meyer, 25 Luddington Rd., West Orange, N.J.

Filed Sept. 15, 1971, Ser. No. 180,638

Int. Cl. D04b *21/00*

U.S. Cl. 66—195 **1 Claim**



A tubular stretchable fabric for use to bind surgical dressings, wounds and the like which includes a first plurality of relatively inelastic stitched warp threads and second plurality of relatively elastic weft threads with each thread being alternately interstitched with adjoining threads of the first plurality of threads to provide rectangular openings which enlarge when the fabric is stretched.

3,747,375

APPARATUS FOR SCOURING AND BLOOMING PILE CARPET

Rodman I. Gregg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

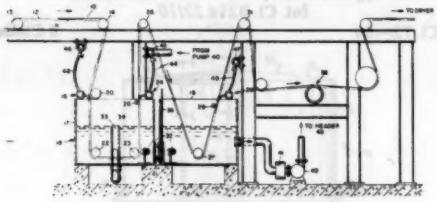
Filed June 4, 1971, Ser. No. 149,963

Int. Cl. B05c *3/152, 9/14*

U.S. Cl. 68—13 R **8 Claims**

Apparatus for continuously scouring and blooming an advancing pile carpet includes facilities for first wetting the

pile side of the carpet with a hot water spray, and then immersing the carpet in a first tank containing hot water. The carpet is then advanced past a high pressure spray positioned above the first tank which directs a high impact spray at the pile to remove the finish on the pile and provide the initial blooming or bulk development of the yarn. The carpet then



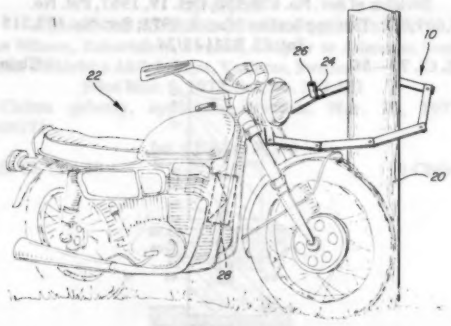
passes through a second tank containing hot water and past a final spray which rinses away any residual finish and provides the final blooming. Water to supply the high pressure spray is pumped from the second tank. The first and second tanks are interconnected so that water can flow from the first tank into the second tank to supply the pump. Facilities are also provided to remove the finish from the water in the first tank.

3,747,376

BAR LOCK LINKAGE

James Carlton White, Jr., 328 Union St., South Weymouth, Mass.

Filed Aug. 23, 1971, Ser. No. 173,812
Int. Cl. E05b *73/00, 71/00*
U.S. Cl. 70—18 **2 Claims**



A linkage for securing a motorcycle to a fixture such as a telephone pole to prevent the theft of the motorcycle. The linkage consists of a bar lock having a plurality of bar links which are pivotally fastened together end to end by rivots. The bar lock has two free ends which may be fastened together by a barrel lock. Each bar link consists of a length of steel bar, and the bar links pivot relative to one another at the rivoted connections so that the bar lock may be folded together into a compact package for storage on the motorcycle while the bike is being used.

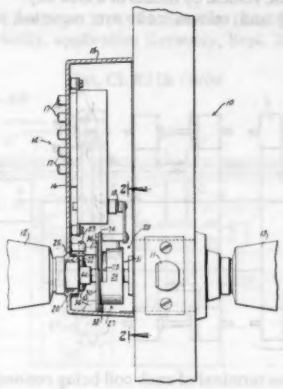
3,747,377

DOOR LOCKING MEANS

Hendrik Van Deudekom, Quebec, Canada, assignor to Unican Security Systems, Ltd., Montreal, Canada

Filed Feb. 7, 1972, Ser. No. 223,890
Int. Cl. E05b *55/06, 37/16*
U.S. Cl. 70—149 **11 Claims**

A permutation lock mechanism governs retraction of door latch means by the knob on the door. Clutch mechanism is so connected between the door knob, the latch means, and a control element on the permutation lock mechanism, that rotation of the knob in one direction, from one position to another, effects retraction of the latch means to free the door for opening only after proper decoding of the permutation



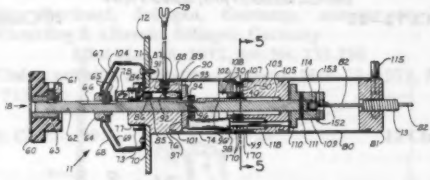
lock mechanism, while such rotation of the door knob in exactly the same way in the event of improper decoding of the lock mechanism by an unauthorized person effects resetting of the lock mechanism.

3,747,378

COMBINATION LOCK AND FUEL CUT-OFF VALVE APPARATUS

Wilbur L. Hiatt, 3140 N. Meridian St., Indianapolis, Ind.

Filed Feb. 26, 1971, Ser. No. 119,296
Int. Cl. B60r *25/04;* **E05b** *17/10, 37/02*
U.S. Cl. 70—257 **4 Claims**



An improved conbination lock and fuel cut-off apparatus to control fuel flow. A valve body is positioned in the fuel input line blocking the flow of fuel. The body is movable by a control wire slidable within an armored cable so as to allow fuel flow. The wire is coupled to a rotatable shaft having a knob mounted to one end. The shaft is locked in place by a combination lock having three independent discs mounted to the shaft. The three discs are rotatable by a shaft key to a predetermined position so as to allow axial movement of the shaft. Each disc is separated from the adjacent disc by a spacer preventing contact between discs. An electrical switch is provided to control current flow and is operable by the rotatable shaft. The lock of this invention is also usable for other applications not related to the control of fuel flow.

3,747,379

ELECTROMAGNETIC SAFETY LATCH SYSTEMS

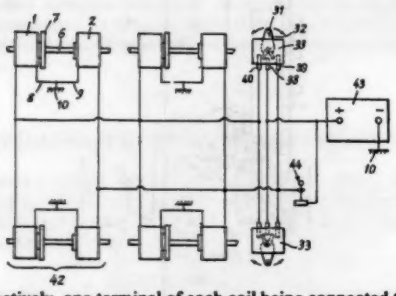
Alain Cabanes, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine) and Automobiles Peugeout, Paris, France

Filed Mar. 20, 1970, Ser. No. 21,384
Claims priority, application France, Mar. 24, 1969, 6908576
Int. Cl. E05b *65/36*
U.S. Cl. 70—264 **1 Claim**

A system for electromagnetically latching all the door locks of a motor vehicle by means of a latch member connected to a

permanent magnet guided between a pair of tandem coils adapted to be selectively connected to a source of direct current for exerting opposed repulsions on said magnet, at least one of said latch members being adapted to be actuated from the outside of the vehicle by means of a lock key.

The latching and release coils are mounted in parallel,



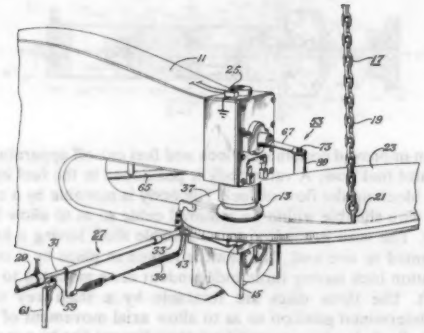
respectively, one terminal of each coil being connected to one terminal of said d.c. source and the other coil terminal is connected to the other source terminal through at least one selection contactor having normally open or front contacts, this contactor being responsive on the one hand to the lock key through the corresponding latch member and on the other hand to a handle actuatable from the interior of the vehicle.

3,747,380

AUTOMATED HANDLING OF VESSEL HEADS

Walter Frizzell, 2816 Sierra Dr., and Quinton D. Gilliland, 2812 Sierra Dr., both of Fort Worth, Tex.

Filed Aug. 13, 1971, Ser. No. 171,499
Int. Cl. B21b *37/08*; B21d *11/04*
U.S. Cl. 72—21 10 Claims



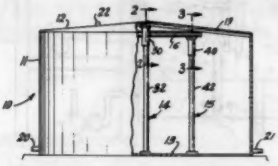
Method of and apparatus for semi-automatically forming dished heads for vessels characterized by the steps of suspending a piece of metal from which the head is to be made and repeatedly incrementally dishing a small portion of the piece of metal in a dishing press in a conventional manner, but automatically advancing the piece of metal a predetermined amount for the next incremental dishing stroke; in contrast to the prior art manual handling of the heads. Also disclosed is a preferred embodiment in which the incremental dishing is effected at a predetermined locus that is automatically effected by positioning a terminal end of a structural element so as to constrain the periphery of the piece of metal to a predetermined position as it is automatically advanced; as well as structural and preferred details in which a peripheral region of the piece of metal is pulled coordinately with the dishing strokes of the dishing press.

3,747,381

METHOD OF REMOVAL DEFORMATIONS FROM STORAGE TANK ROOF

Reign C. Ulm, and Mark D. Kinghorn, both of Schererville, Ind., assignors to Aerojet-General Corporation, El Monte, Calif.

Division of Ser. No. 45,165, June 10, 1970, Pat. No. 3,618,808. This application July 28, 1971, Ser. No. 166,986
Int. Cl. B21d *22/10*
U.S. Cl. 72—54 8 Claims



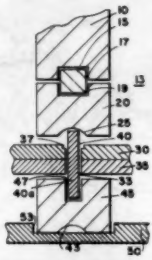
A method for removing deformations from a roof structure of a storage tank of the type wherein the roof is supported by vertical columns. The method comprises the steps of: (a) creating an upward force against the underside of the roof structure thereby increasing the length of the columns; and (b) removing the upward force while retaining the columns in their increased length. The apparatus provides a storage tank having a plurality of support columns adjustable in length and specific means to retain the columns in an increased length.

3,747,382

METAL WORKING APPARATUS AND PROCESS

Robert C. McMaster; Charles C. Libby, both of Columbus; Hildegard M. Minchenko, Reynoldsburg, and Frederick A. DeSaw, Columbus, all of Ohio, assignors to The Ohio State University, Columbus, Ohio

Division of Ser. No. 676,550, Oct. 19, 1967, Pat. No. 3,609,851. This application Mar. 8, 1971, Ser. No. 122,215
Int. Cl. B21j *15/24*
U.S. Cl. 72—56 4 Claims



This invention relates generally to the application of electromechanical transducer energy to a workpiece, and particularly to the utilization of a high Q electromechanical transducer capable of delivering extremely high-power outputs to a work surface for the deformation of metallic or non-metallic materials, such as, in riveting, cold heading, bonding, and swaging.

3,747,383

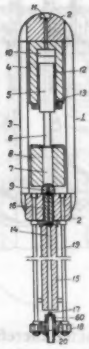
PRESS FOR HYDROSTATIC EXTRUSION OF LONG BILLETS

Jan Nilsson, Robertsfors; Pertti Syvakari, and Erik Westman, both of Vasteras, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 1, 1972, Ser. No. 230,902
Claims priority, application Sweden, Mar. 12, 1971, 3169/71
Int. Cl. B21c *23/21*
U.S. Cl. 72—60 7 Claims

A press for the hydrostatic extrusion of long billets has a stand with a pressure generating chamber and a pressure

generating plunger insertable in the pressure generating chamber to generate high pressure in a pressure medium contained therein. A pressure chamber is arranged in line and communicates with the pressure generating chamber. A stationary support table is provided to take up axial forces on a



die, and is spaced from the opening of the pressure chamber so that a die can be inserted into alignment with the opening of the pressure chamber. The support table contains a piston which is movable in the direction of the pressure chamber and on which the die support is carried for movement of the die into the opening of the pressure chamber opening.

3,747,384

COMBINED METHOD OF AREA REDUCTION

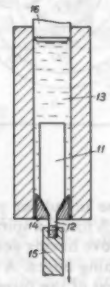
Jan Nilsson, Robertsfors, Sweden, assignor to Alimanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 9, 1972, Ser. No. 233,151

Claims priority, application Sweden, Mar. 18, 1971, 3486/71

Int. Cl. B21c *31/00*

U.S. Cl. 72—60 4 Claims



In the hydrostatic extrusion of a body through an opening, such as a die opening, the hydrostatic extrusion is begun by raising the pressure of the pressure fluid to a predetermined amount, and thereafter while continuing such pressure applying a tensile force to a portion of the body which is beyond the opening. The portion extending through the die may be preformed, or may be formed by the starting of hydrostatic extrusion. The end of the billet which engages the die is formed with double conicity.

3,747,385

AUTOMATIC PIERCING POINT CHANGE APPARATUS

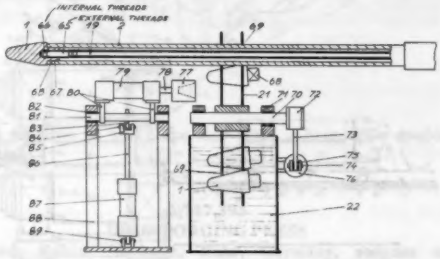
Hans Meurer, and Ewald Bruels, both of Moenchengladbach, Germany, assignors to Wean Industries, Inc., Youngstown, Ohio

Filed Sept. 27, 1971, Ser. No. 184,103

Claims priority, application Germany, Sept. 28, 1970, P 20 48 990.1

Int. Cl. B21b *19/04*

U.S. Cl. 72—69 15 Claims



The invention relates to apparatus for automatically changing and cooling the piercing point used in a piercing mill operation, the point being connected to the piercing bar in a manner so that it may be removed therefrom only after its release from the pierced tube so that it cannot stick in the tube and so that the cooling function may take place outside of the heat range of the mill.

3,747,386

STRAIGHTENING APPARATUS FOR ELONGATED TUBULAR AND ROD STOCK

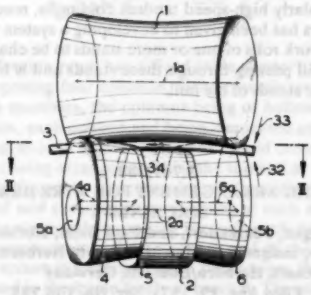
Heinz Hartkopf, Solingen, Germany, assignor to The Kieserling & Albrecht, Solingen, Germany

Filed Mar. 16, 1972, Ser. No. 235,298

Claims priority, application Germany, Mar. 22, 1971, P 21 13 713.3

Int. Cl. B21d *1/02*

U.S. Cl. 72—99 12 Claims



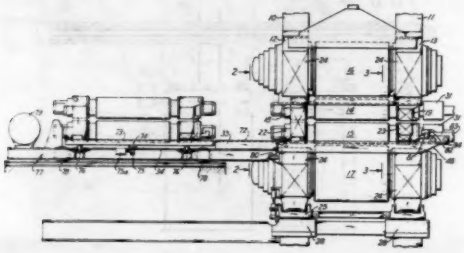
A straightening pass in an apparatus for straightening of elongated tubular or rod stock has a concave skew roll and a composite second skew roll located opposite the concave roll with reference to the center line of the pass. The second skew roll has a driven median section provided with two coaxial trunnions and two outer sections each of which has a disk eccentrically mounted on a trunnion and a stock-engaging ring which is rotatable on the respective disk. The disks are angularly adjustable on their trunnions and are adjustably coupled to a holder for the second skew roll. The rings can be rotated in response to rotation of the median section by providing them with internal gears which receive torque from gears provided on the respective trunnions.

3,747,387

ROLL CHANGING ARRANGEMENT FOR A ROLLING MILL

Charles Storer Shumaker, Glenshaw, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Mar. 27, 1972, Ser. No. 238,308
Int. Cl. B21b 31/08
U.S. Cl. 72—239 **10 Claims**



The disclosure of this invention relates to a rolling mill wherein the chocks of the work roll on the drive side of the mill are split to enable the work rolls to be removed and replaced while strip is still being passed between the rolls. The chocks of the work rolls on the operating side are nested. The work roll chocks are provided with wheels which, during the roll changing operation, are carried by a pair of upper tracks secured to the housings and chocks of the upper backup roll and by a pair of lower tracks carried only by the housings. A lower track runs past the front of the mill to a side shifting unit having tracks which serve as continuations of the lower tracks and which receive the wheels of the chocks of the operating side work roll and the wheels of the chock of the lower drive side work roll as the rolls are brought to and from the mill to transfer them from and to the side shifter. The wheels of the chock of the upper drive side work roll are held apart after the drive side chocks leave the mill by a plunger displaced by a cam and cam track.

In an attempt to improve the productivity of rolling mills, and particularly high-speed tandem cold mills, much effort in recent years has been given to developing a system that would allow the work rolls of one or more stands to be changed while a strip is still passing through these stands and is being rolled by the other stands of the mill.

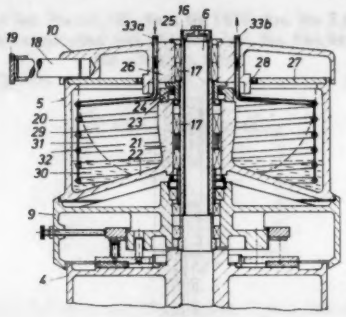
3,747,388

COOLING ARRANGEMENT FOR WIRE DRAWING MACHINES

Werner Hagen, Penzendorf, and Paul Diehl, Herborn, both of Germany, assignors to Maschinenfabrik Herborn Kommanditgesellschaft, Herborn/Dillkreis, Germany

Filed Apr. 29, 1971, Ser. No. 138,725
Claims priority, application Germany, Apr. 29, 1970, P 20 20 926.1
Int. Cl. B21c 9/00
U.S. Cl. 72—286 **6 Claims**

Apparatus for cooling the wire in a wire drawing machine, particularly by cooling one or more of the drums around which the wire is wrapped. A drum around which the wire is wrapped, either a pulling drum or a storage drum, is made hollow and filled with a first fluid cooling medium. A liquid conductive heat exchanger is placed within said first cooling medium within said drum and extends through suitable means outwardly therefrom. A second cooling medium is caused to flow through said heat exchanger for extracting heat from said first cooling medium. Thus heated wire from a drawing die is wrapped around said drum, yields at least a substantial portion of its heat to said drum which heat is then absorbed by the first



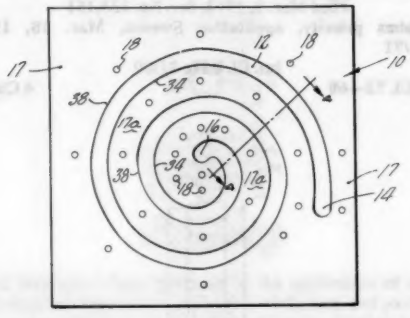
cooling medium and extracted therefrom and carried to suitable disposable means by the second cooling medium.

3,747,389

METHOD AND APPARATUS FOR DETERMINING EXACT SHRINK AND STRETCH LIMITS IN RUBBER PAD FORMING OF CURVED FLANGED MEMBERS

John W. Harvey, Milford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 31, 1971, Ser. No. 176,461
Int. Cl. B21d 31/00
U.S. Cl. 72—375 **6 Claims**



A form block for use in rubber pad forming has a spiral groove cut therein which forms a spiral land between adjacent convolutions of the groove having generally parallel inner and outer spiral flange forming edges. A spiral sheet metal blank which matches the spiral of the form block but is wider than the spiral land on the block is secured to the block with its spiral edges extending beyond the inner and outer edges of the land on said block to produce spiral shrink and stretch flanges on said blank during a press forming operation. By observing where on the inner and outer flanges the flanges formed become unacceptable, and measuring the radius to each of these points, the exact minimum radii contour for both shrink and stretch flanges can be determined for the material and temper condition of the sheet metal comprising the blank. A modification of the grooved form block is shown to accommodate a spiral draw ring by which draw ring data can be obtained with the same blanks.

3,747,390

METHOD FOR STAMPING MODULATED GROOVES INTO INFORMATION CARRIERS

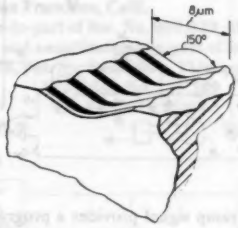
Herbert Knothe, Neumunster; Jurgen Buck, Nortorf; Heinz Borchard, Nortorf, and Bruno Rybka, Nortorf, all of Germany, assignors to Teldec Telefunken-Decca Schallpatten GmbH, Hamburg, Germany

Filed Nov. 3, 1971, Ser. No. 195,133

Claims priority, application Germany, Nov. 3, 1970, P 20 53 837.8

Int. Cl. B21k *23/00*

U.S. Cl. 72—376 8 Claims



Record copies are formed in a stamping operation in which no heat need be applied by employing a stamping pressure in excess of 1,000 kiloponds/cm².

3,747,391

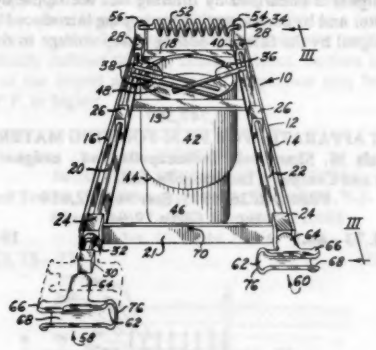
CABLE BENDER

Henry B. Durham, 306 S. 23rd St., Birmingham, Ala.

Filed Aug. 9, 1971, Ser. No. 170,071

Int. Cl. B21d *11/00*

U.S. Cl. 72—387 4 Claims



A wire or cable bender which has two spaced counter-rotating bending heads attached to the adjacent ends of a pair of spaced shafts and including lever arms attached to the opposite ends of the shaft which are driven by a hydraulically powered piston.

3,747,392

CONTAINER SIDE STRIPE TESTING MEANS

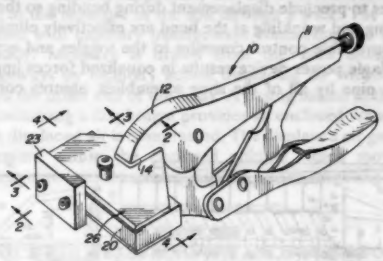
Paul H. King, Woodridge, and Edward L. Skrzecz, Burbank, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,085

Int. Cl. B21d *9/08*

U.S. Cl. 72—409 1 Claim

A clamping device for testing the bond of the side stripe at the side seam. The clamping device includes structure for bending the side seam into a tight hem at approximately the same location as which the side seam is bent upon double seaming.



3,747,393

DROP FORGING PRESS

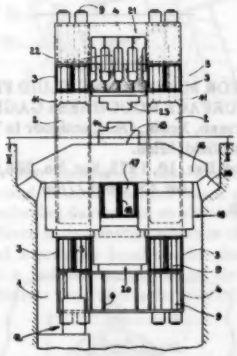
Helmut Robra, Mulheim, Ruhr, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 29, 1971, Ser. No. 184,698

Claims priority, application Germany, Sept. 29, 1970, P 20 47 711.8

Int. Cl. B21j *13/04*

U.S. Cl. 72—455 14 Claims



A drop forging press has a fixed table support and a press frame comprising four columns, eight crosspieces and a plurality of tie members, the columns being of hollow polygonal cross-section, each column and being connected at its top and at its bottom to both adjacent columns by said crosspieces, the crosspieces being arranged, both at the top and at the bottom of the press frame in a rectangular configuration as seen in plan, two of said crosspieces overlapping at each end of each column, the tie members passing through each pair of overlapping crosspieces into the respective end of the respective column to secure the crosspieces to the column. Wedges may be interposed in the frame firmly to brace it. The table support may be supported by a bending support via a piston and cylinder unit. The press frame may be capable of moving up and down.

3,747,394

PIPE MANDREL FOR USE DURING BENDING

Joseph A. Cunningham, Tulsa, Okla., assignor to Evans, Pipeline Equipment Co., Tulsa, Okla.

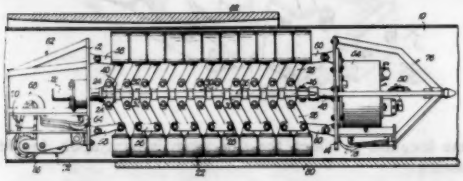
Filed Mar. 27, 1972, Ser. No. 238,107

Int. Cl. B21d *9/01*

U.S. Cl. 72—466 16 Claims

A pipe bending mandrel for use inside the pipe embodies a flexible body suspended between spaced supports and made of

a series of diametrically opposed, pipe-engaging shoes that are clamped tightly in place against the pipe by toggle joints in a manner to preclude displacement during bending so that pipe buckling and wrinkling at the bend are effectively eliminated. A reciprocable control common to the toggles and actuated by a single power device results in equalized forces imparted to the pipe by all of the shoe assemblies, assures complete



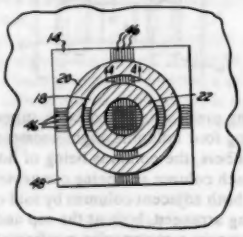
lock-in of all of the assemblies prior to bending, and causes all of the assemblies to cooperate in preventing collapse of any one or more of the assemblies while bending takes place. The shoes are stragetically arranged only along those zones where buckling and wrinkling would normally occur, but at those zones the shoes are shaped, sized, spaced and adequate in number such as to accomplish optimum results.

3,747,395

MASTER FOR MONITORING FLUID FLOW TYPE SURFACE ROUGHNESS GAGES

Charles R. Sherman, Xenia, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1972, Ser. No. 206,038
Int. Cl. G01l 27/00
U.S. Cl. 73—1 R **4 Claims**



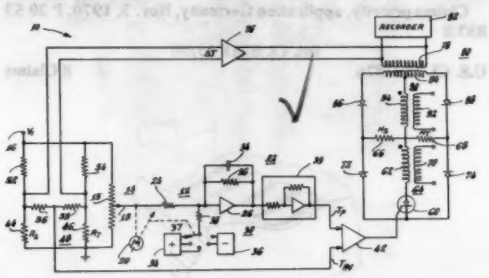
A block-type master is described which has formed on the surface thereof a series of straight line grooves, and which in carrying out the monitoring method is placed so that the groove series extends traversely to and contained entirely within the annular flow groove in the smoothness measuring reading head. The depth of the grooves is carefully controlled to create The flow precisely corresponding to that of a given roughness standard to thus provide a ready check on the accuracy of the instrument and also a convenient indicator of the cause of the instrument inaccuracy. The configuration of the flow grooves in the master allow for precise uniformity of groove depth in manufacture thereof, while this factor and the transverse placement of the flow grooves create relative insensitivity to alignment of the master and reading head, thus allowing rapid and highly accurate and repeatable monitoring checks of operating instruments.

3,747,396

LINEARIZING CIRCUIT FOR A RAMP GENERATOR IN A DIFFERENTIAL SCANNING CALORIMETER

Michael J. O'Neill, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed July 9, 1971, Ser. No. 161,024
Int. Cl. G01n 25/00
U.S. Cl. 73—15 B **5 Claims**



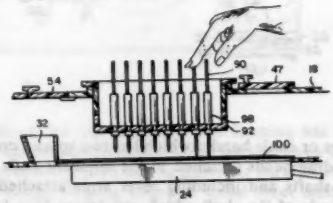
An electrical ramp signal provides a programmed increase or decrease of energy applied to a sample and a reference material. The ramp signal, which may, for example, be derived from a potentiometer or the like, provides a scanning range of setpoint temperatures to which a sample and a reference material are heated. The temperature of the sample is maintained in substantial dynamic equilibrium with the temperature of the reference material by the calorimeter. The ramp signal may exhibit nonlinearities, such as steps, rather than being a continuously variable signal. Since the measured output of the calorimeter is the differential power needed to maintain dynamic equilibrium, the output exhibits ripples due to such nonlinearities. The measured output is an analog output and includes peak components as well as a baseline component that exhibits ripple at low frequencies of scanning. The ramp signal is linearized by filtering out the ripple by a low pass filter and by compensating for any lag introduced into the ramp signal by the filter by adding a step voltage to the ramp signal.

3,747,397

TEST APPARATUS FOR FILM-FORMING MATERIALS

Moustafa M. Sharabash, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 26, 1971, Ser. No. 192,014
Int. Cl. G01n 19/04
U.S. Cl. 73—64.1 **19 Claims**



A gelatin film is spread on a flat steel plate from a spreader bucket and blade moved over the plate at uniform speed. To provide controlled gelling conditions, the plate temperature is held constant by water flow across its bottom and conditioned air is circulated through a housing over the plate. A plurality of test probes mounted above the plate are depressed into contact with and withdrawn from the gelatin film, in timed sequence. The probes are wetted by un-gelled film and draw strands therefrom which remain connected to the probes, whereas the probes do not draw strands from gelled film but

form dimples therein. The strands and dimples may be retained as a record, and gelation time is accurately determined by observing either or both of when the successively-depressed probes cease to draw strands or start to form dimples. Strand thickness and dimple size varies at different stages to reveal gelation characteristics.

3,747,398

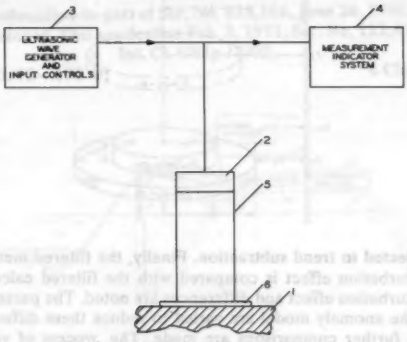
ULTRASONIC INSPECTION APPARATUS USING CERTAIN POLYMERIC MATERIALS AS COUPLANTS

Richard P. Rathburn, Richmond, and Garth M. Stanton, San Anselmo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 809,029, March 20, 1969, abandoned, and a continuation-in-part of Ser. No. 20,069, March 16, 1970, Pat. No. 3,606,791. This application Sept. 20, 1971, Ser. No. 181,789

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.9 **4 Claims**



An apparatus is disclosed for making ultrasonic inspections of high surface temperature objects by using as a couplant a polymeric material of polysulfone or polyester resin having specifically defined thermal characteristics. Surface temperatures of the object at the point of inspection may be 300° – 1,100° F. or higher.

3,747,399

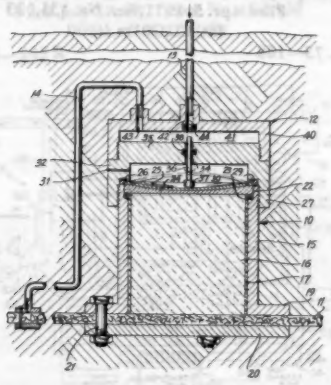
MOISTURE RESPONSIVE DEVICE

Eduard Treirat, 576 Broughton Ave., Bloomfield, N.J.

Filed Aug. 17, 1971, Ser. No. 172,408

Int. Cl. G01n *25/56*

U.S. Cl. 73—73 **10 Claims**



A device responsive to the presence of moisture in soil for controlling the flow of irrigating water to the soil being monitored. The device comprises a cylindrical body of capillary material of controlled porosity having one end surface exposed to the moisture in the soil through a wick. The body is provided with capillary passageways connecting the ends of the body. Moisture is drawn from the wick along these passageways by capillary action displacing air which moves toward the other end of the body. A casing sealed to the body and containing a diaphragm provides an enclosed volume into which displaced air is compressed. The displaced air generates a pressure within the enclosed volume which moves the diaphragm to operate a valve shutting off the irrigating water.

3,747,400

DEVICE FOR MEASURING THE ANCHORING FORCES IN PRESTRESSED GROUND OR ROCK ANCHORS

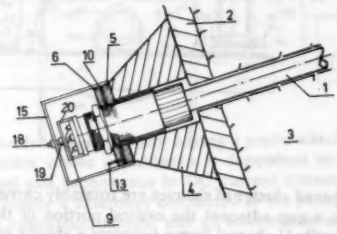
Klemens Finsterwalder, Socking uber Starnberg, Germany, assignor to Firma Dyckerhoff & Widmann Aktiengesellschaft, Socking uber Starnberg, Germany

Filed June 30, 1971, Ser. No. 158,382

Claims priority, application Germany, July 25, 1970, P 20 37 060.9

Int. Cl. G01n *3/00*; G08b *3/06*

U.S. Cl. 73—88 E **5 Claims**



The device for measuring the anchoring forces in prestressed ground or rock anchors has a cushion disposed between the anchoring device and an abutment plate to which the anchoring force is transmitted which is charged with pressure agent, and a pressure head on the abutment plate has mounted on it a bolt for operating an electric switch that operates an indicator that reflects the start of movement.

3,747,401

ENERGY METER USING GAS AS AN ENERGY ABSORBER

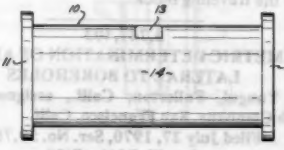
Derwyn C. Johnson, Ottawa, Ontario, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence of Her Majesty's Canadian Government

Filed Aug. 20, 1970, Ser. No. 65,583

Claims priority, application Canada, Aug. 29, 1969, 060,796

Int. Cl. G01k *17/00*; G01t *1/205*

U.S. Cl. 73—190 R **2 Claims**



An energy measurement cell is disclosed in which an absorbing gas is contained which absorbs the energy of an incident pulse of infra-red energy, and undergoes a pressure rise which is sensed by a pressure transducer to given electrical output proportional to the energy absorbed by the cell. Sulfur hexafluoride is disclosed as an absorbing gas which may be

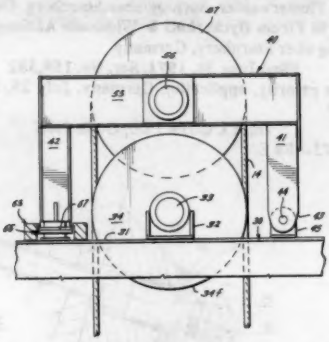
mixed with a buffer gas such as argon to improve the operation of the cell.

3,747,402

ARRANGEMENT FOR MEASURING THE LOAD ON A HOOK CARRIED BY A TRAVELING BLOCK WHICH IS SUPPORTED FROM THE CROWN BLOCK OF A DRILLING MAST

Donald R. Branham, and Paul E. Borg, both of Houston, Tex., assignors to Pyramid Derrick & Equipment Corp., Houston, Tex.

Filed May 12, 1972, Ser. No. 252,904
Int. Cl. G01g *19/14*; B66c *13/16*
U.S. Cl. 73—151 **4 Claims**



Spaced cluster of sheaves are rotatably carried on a shaft to form a gap adjacent the central portion of the shaft, and a generally U-shaped frame supports a sheave in elevated relation between the clusters and in the gap. One part of the frame forming the first upwardly extending frame member is pivotally supported at its lower end and a second upwardly extending frame member is formed by two legs connected at their upper ends which diverge from such connection toward their upper ends and is adapted to engage a pressure responsive load cell means positioned therebeneath. Means are provided for limiting the vertical and lateral movement of the second upwardly extending frame member relative to the pressure responsive load cell means, and a flexible line is reeved over a fast line sheave and then over the sheave in one of the clusters and then down to the traveling block and thence back and forth between the sheaves in one cluster and the traveling block and then upwardly over the elevated sheave in the gap between the clusters and then down to the traveling block and thence back and forth between the sheaves in the second cluster and is then secured at its end in the mast. When a load is carried by the hook, this is transmitted by the flexible line from the traveling block to the cluster of sheaves including the elevated sheave which exerts a pressure upon the pressure responsive load cell means. This functions as a transducer and supplies an indication to suitable gauge or indicator means for indicating the load on the hook carried by the traveling block.

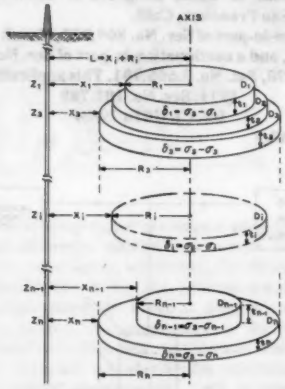
3,747,403

GRAVIMETRIC DETERMINATION OF ANOMALIES LATERAL TO BOREHOLES

Sulhi H. Yungul, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 27, 1970, Ser. No. 59,783
Int. Cl. E21b *47/00*
U.S. Cl. 73—151 **8 Claims**

A portable gravimeter is traversed over a selected interval in an exploratory borehole. Formation density data is obtained for the same selected interval. This gravity and density information is then combined with the gravity value at the surface of the borehole when no anomaly is present, the "free air" correction and the Bouguer correction to obtain a measured perturbation effect. The measured perturbation effect represents the net perturbation in the gravity values measured within the borehole due to the presence of a gravimetric anomaly lying lateral to the borehole. The measured perturbation effect is subjected to high pass filtering to render it solely a function of the lateral distance from the borehole to the adjacent flank of the gravimetric anomaly. A trend is subtracted from the filtered measured perturbation effect. Anomaly models are then employed to simulate the gravimetric anomaly which produces the measured perturbation effect. A calculated perturbation effect is generated for the anomaly model. This calculated perturbation effect is high pass filtered and is



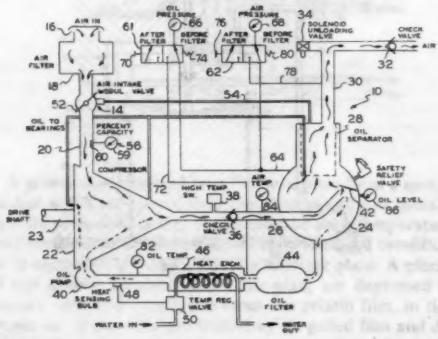
subjected to trend subtraction. Finally, the filtered measured perturbation effect is compared with the filtered calculated perturbation effect and differences are noted. The parameters of the anomaly model are varied to reduce these differences and further comparisons are made. The process of varying parameters and making comparisons is repeated with the aid of iterative computer programs employing regression techniques such as the method of least squares. When the differences between the filtered measured perturbation effect and the filtered calculated perturbation effect are smaller than some preassigned arbitrary number the anomaly model represents the actual anomaly. The distances between the anomaly model and the simulated borehole are the actual distances between the gravimetric anomaly and the exploratory borehole.

3,747,404

AIR COMPRESSOR SYSTEM

Walter M. Novak, Portland, Oreg., assignor to Rogers Machinery Company, Inc., Portland, Oreg.

Filed Apr. 5, 1971, Ser. No. 131,023
Int. Cl. G01m *19/00*
U.S. Cl. 73—168 **5 Claims**



An air pressure measuring system responsive to pressure between a modulating valve and an air intake of a screw-type

air compressor is calibrated in percent of the capacity of the compressor, this air intake pressure varying inversely and linearly with variations in percent of capacity at which the compressor operates. Oil is pumped with the air by the compressor to a receiver-reservoir and then through an oil filter and a cooler back to the compressor. A momentary valve normally connects an oil pressure gauge to the inlet side of the oil filter and, upon manual actuation, connects the oil pressure gauge to the outlet side of the oil filter. A second momentary valve normally connects an air pressure gauge to the receiver-reservoir and, upon manual actuation, connects this air pressure gauge to the outlet of an oil separator through which air from the receiver-reservoir passes.

3,747,405

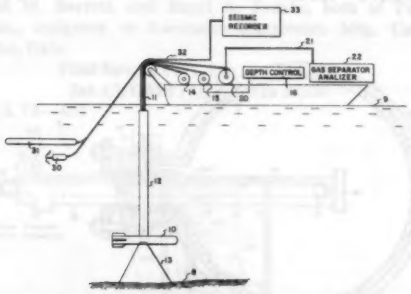
MAPPING HYDROCARBON SEEPAGES IN WATER-COVERED REGIONS

Eldon R. Fort; Basil O. Prescott, and Arley Walters, all of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 835,166, June 20, 1969, abandoned. This application Feb. 3, 1971, Ser. No. 112,476

Int. Cl. G01p *13/00*

U.S. Cl. 73—170 A **6 Claims**



In exploring a water-covered region, a water sampling vehicle is moved through known areal locations within a measured relatively short distance from the bottom of the body of water. Water is pumped from the sampling vehicle to an analyzing system and measurements are made of the areal locations, distances above bottom, and concentrations of at least one hydrocarbon in the water encountered by the sampling vehicle.

3,747,406

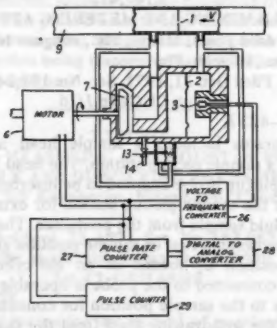
FLUID FLOWMETER

Robert Maurer, 69, Torby Rd., Rayners Ln., Harrow, England

Filed July 29, 1971, Ser. No. 167,120

Int. Cl. G01f *1/04*

U.S. Cl. 73—205 R **7 Claims**



A fluid flowmeter of the pitometer log kind in which an auxiliary pump is driven to balance off the pressure difference detected as a result of the fluid flow through a constriction, the speed of the pump being nominally related to the rate of fluid flow, there being provided (a) correction means such as a bleed valve for affecting the pump output pressure and control means to control the correction means for linearising the flowmeter characteristic and (b) a synchronous driving motor for the pump driven by a pulse generator, flow rate indication being derived from the pulse generator output.

3,747,407

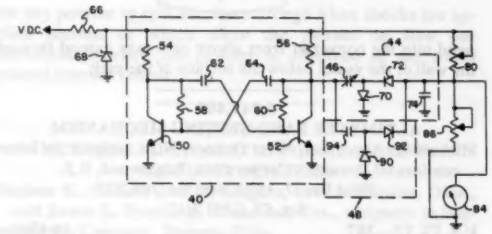
PROBE MOUNTED ELECTRONICS FOR FUEL GAGE SYSTEM

Irwin Wallman, Great Neck, N.Y., assignor to Consolidated Airborne Systems, Inc., Carle Place, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,512

Int. Cl. G01f *23/26*

U.S. Cl. 73—304 C **9 Claims**



A capacitance fuel gaging system having a probe which includes a capacitor whose capacitance is dependent on the level of the fuel and capacitance to DC current conversion means. A DC supply is externally connected to the probe for energizing the conversion means, and an indicator is externally connected to the probe for displaying the output.

3,747,408

TEMPERATURE MEASUREMENT

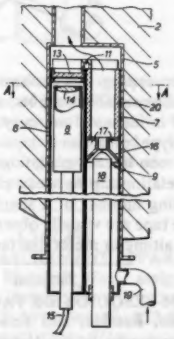
Colin Graham Stanworth, Penbryn; John Dixon, and David Ian Jones, both of Rotherham, all of England, assignors to British Steel Corporation, London, England

Filed Oct. 13, 1971, Ser. No. 188,839

Claims priority, application Great Britain, Oct. 15, 1970, 49,097/70

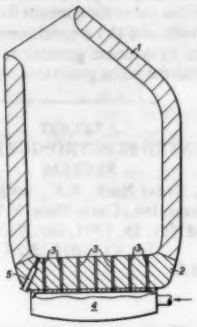
Int. Cl. G01j *5/04, 5/60*

U.S. Cl. 73—355 EM **7 Claims**



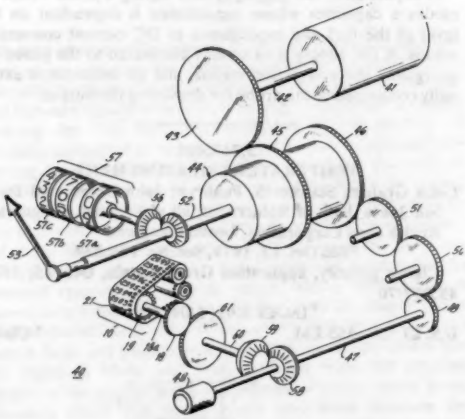
The temperature of molten steel in a converter is measured by blasting an inert gas through a tube into the melt so as to provide a gas/liquid interface adjacent the end of the tube and measuring the temperature of the melt by sighting radiation pyrometer along the tube through the gas towards the interface.

More particularly the gas is heated e.g. by a plasma arc, to a temperature approximating that of the melt. The tube may de-



pend into the converter from above or it may extend through the wall of the vessel below the surface of the melt.

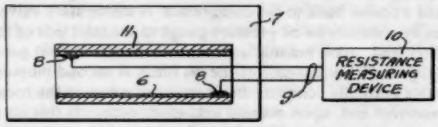
3,747,409
ALTIMETER BARO-SETTING MECHANISM
Michael A. Argentieri, West Orange, N.J., assignor to Intercontinental Dynamics Corporation, Engelwood, N.J.
Filed Dec. 7, 1971, Ser. No. 205,577
Int. Cl. G01l 7/12
U.S. Cl. 73—387 **10 Claims**



In barometric setting mechanisms for aircraft altimeters providing visually readable outputs, an elongated, non-linear scale calibrated in inches of mercury and/or millibars printed upon a scroll-type preformed tape movable by a driving sprocket, the non-linear gradations provided serving to represent the relationship between pressure altitude and the barometric setting number of a specified range. The indicia provided on the tape are visually observable through a window provided in the altimeter meter dial face.

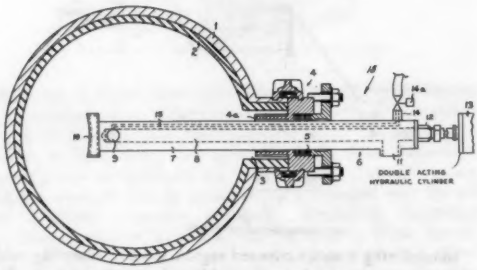
3,747,410
INDIUM-SESQUIOXIDE VACUUM GAUGE
Rudolf F. Nissen, Batavia, and Edward B. Tilles, Aurora, both of Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed July 5, 1972, Ser. No. 269,003
Int. Cl. G01l 9/02
U.S. Cl. 73—398 AR **5 Claims**

A gauge of pressure at and below atmospheric pressure is formed by applying indium in a controlled amount to an insulating surface, oxidizing the indium to indium sesquioxide, and measuring the electrical resistance between contacts at two locations on the layer of indium sesquioxide. The electrical re-



sistance thus measured is a function of the ambient pressure to which the layer is exposed, providing a useful gauge over the range from atmospheric pressure to 10^{-7} Torr.

3,747,411
SUSPENSION SAMPLING
William Francis McDermott, Chagrin Falls, Ohio; Joseph James Plaistow, St. Paul, and Veikko Adolph Hirvela, Hibbing, both of Minn., assignors to Pickands Mather & Co., Cleveland, Ohio
Filed July 12, 1971, Ser. No. 161,650
Int. Cl. G01n 1/14
U.S. Cl. 73—422 R **3 Claims**

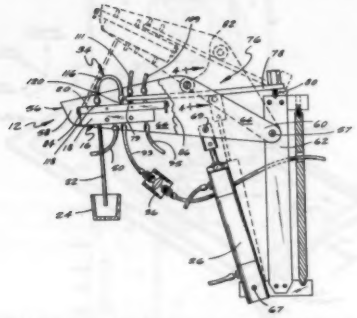


A suspension sampling device designed for taking, at regularly timed intervals, samples of ore pulp slurries having abrasive characteristics, as they are passed through a pipeline; the device being provided with means for inserting a sampling tube into the pipe for removal of a representative portion of the flowing pulp stream, and when necessary, means for removing from the sampling tube all portions of the sample taken which may adhere to, or tend to remain within, the sampling tube after its withdrawal from the pipeline.

3,747,412
SAMPLE MIXING AND METERING APPARATUS
Alan Richardson Jones, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.
Filed Oct. 21, 1971, Ser. No. 191,248
Int. Cl. G01n 1/16
U.S. Cl. 73—423 A **29 Claims**

The apparatus includes a sample head adapted to be mounted at a sample pickup station. The head includes a hollow sample pickup probe adapted to be inserted into a sample container at the sample pickup station for extracting a given mount of fluid sample from the container. The pickup probe : movable between a first or sample position and a second or :tracted position by means of an air cylinder. A valve mechanism connected to the probe is operable on movement of the probe to the sample position for connecting the probe to a device for withdrawing fluid from the sample container through the probe. The air cylinder not only moves the probe but also, and at the same time, operates the valve mechanism.

In the second position the valve mechanism effects fluid connections for mixing a given amount of the fluid sample with



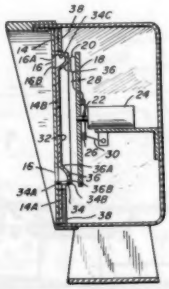
another fluid and for simultaneously transferring the mixture to a receptacle.

3,747,413

LIGHT SHIELD FOR AN INDICATING INSTRUMENT

Burton M. Barrett, and Buyrl A. Franks, both of Tulsa, Okla., assignors to Lawrance Electronics Mfg. Corp., Tulsa, Okla.

Filed Nov. 8, 1971, Ser. No. 196,608
Int. Cl. G01d *11/24*; G02b *27/00*
U.S. Cl. 73—431 6 Claims



A light shield for an indicating instrument including a face plate having a forward surface in view of the user and a rearward surface adjacent a lighted indicating element, the plate having an elongated window therein for viewing the indicating element, the elongated window having a cross-sectional configuration providing a first, flat portion substantially normal to the face plate and extending rearwardly thereof and the window having a second, arcuate portion extending from the rearward surface of the plate from one edge of the window, the arcuate portion intersecting the rearward end of the flat portion, the arcuate portion being transparent and all other portions of the plate being opaque.

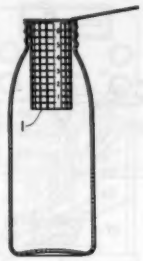
3,747,414

DEVICE FOR MEASURING AN AMOUNT OF POWDERED MILK AND DISSOLVING THE SAME

Masaji Ohno, 2-5 Kayabacho, Nikonbashi, Chuo-ku, Tokyo, Japan

Filed Sept. 23, 1971, Ser. No. 183,053
Claims priority, application Japan, Oct. 5, 1970, 45/98138
Int. Cl. G01f *19/00*
U.S. Cl. 73—428 10 Claims

A device for measuring an amount of powdered milk and dissolving the same, comprising a substantially cylindrical vessel which can be inserted into a nursing bottle through the mouth portion thereof, the wall of said vessel having perforations of such sizes that dry powdered milk can be prevented from spilling out therethrough under the static gravity thereof due to the static friction of the dry powder, but which allow



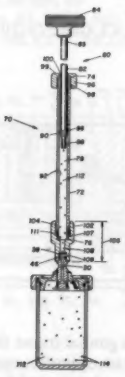
the dry powder to spill out therethrough when shocks are applied thereto or which allow the powder to flow out therethrough when the powder is dissolved in the water poured into the vessel.

3,747,415

METHOD AND APPARATUS FOR MEASURING ABSOLUTE DENSITIES

Stephen K. Nickles; Joel M. Stogner, both of Duncan, Okla., and James L. Doerksen, Monahans, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 7, 1971, Ser. No. 131,963
Int. Cl. G01n *9/02*
U.S. Cl. 73—433 6 Claims



Disclosed herein is a method and an apparatus for measuring the absolute densities of fluids. The apparatus includes a sample cup and a sealing cap with a valve therein through which the cup can be charged with fluid to be measured. A pressure pump and weighing device are also disclosed with which the cup is charged and weighed.

3,747,416

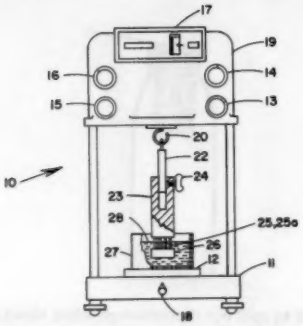
DENSITY MEASUREMENT APPARATUS

Walter C. Wommack, Marshall, Tex., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed July 17, 1972, Ser. No. 272,526
Int. Cl. G01n *9/10*
U.S. Cl. 73—437 3 Claims

An apparatus or machine is presented which measures the density of a solid material by weighing it in air and then weighing it submerged in mercury after which the density is obtained by simple calculation. The use of mercury as the displaced fluid medium enhances the accuracy of the measure-

ment. The sample is supported by thin rods on a weighted member and is forced below the surface of the mercury by the weighted member thus overcoming any natural tendency to



float which the specimen and the related apparatus may have. The device is calibrated to account for the small displacement of the supporting rods.

3,747,417

GYROSCOPES INCLUDING GAS LUBRICATED BEARINGS

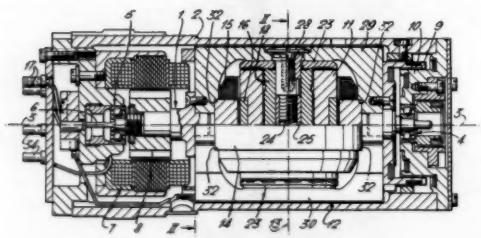
Geoffrey Beardmore, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Division of Ser. No. 36,655, May 12, 1970. This application June 3, 1971, Ser. No. 149,642

Claims priority, application Great Britain, May 14, 1969, 24,634/69; May 14, 1969, 24,635/69; May 14, 1969, 24,636/69

Int. Cl. G01c *19/20*

U.S. Cl. 74—5 R **16 Claims**



A rate gyroscope has a gimbal frame that is divided into two parts that are clamped to opposite ends of the journal assembly of a self-acting gas-lubricated bearing supporting the electrically-driven gyroscope-rotor of tungsten carbide. The journal assembly includes a boron-carbide shaft that is embraced by the annular rotor and extends across the frame as a rigid strut with boron-carbide bearing thrust-plates clamped to its two ends within the frame. The electrically-wound armature-ring of the rotor-motor is retained and located on the frame by the two frame-parts clamped to bear on its rim. The boron-carbide material may be replaced by silicon carbide.

3,747,418

FLUIDIC INERTIAL PLATFORM

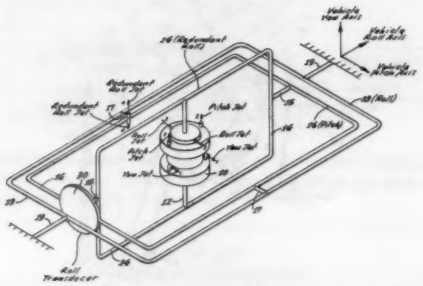
Jay Hoffman, Livingston; Raymond E. Weber, Jersey City, and Constant J. DeCotiis, Cranford, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 8, 1971, Ser. No. 151,024

Int. Cl. G01c *19/30*

U.S. Cl. 74—5.43 **5 Claims**

An improved gyro stabilized inertial platform is provided which employs fluidic concepts in the entirety of its operation. The inertial platform to be described may serve as a mounting base for accelerometers, distance measuring devices, and the like. It may also provide angular read-out signals for pitch, roll and yaw of the vehicle in which it is installed. The fluidic con-



trolled inertial platform of the invention operates at all attitudes, and it is particularly useful in aircraft, missiles and other space vehicles which are subject to abrupt flight maneuvers.

3,747,419

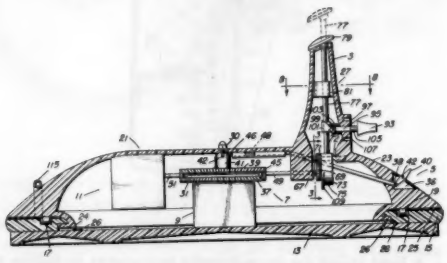
ORBITER WITH ROCKING MOTION

Joseph L. Horvath, Corvallis, Oreg., assignor to Roland J. Beecroft, Corvallis, Oreg., a part interest

Filed Oct. 21, 1971, Ser. No. 191,405

Int. Cl. F16h *21/00*

U.S. Cl. 74—22 **10 Claims**



Apparatus for producing orbital movement and rocking motion to a platform which may comprise a seat or enclosure for an infant, and also for providing music concurrently with the orbital and rocking motion. The means for providing the orbital movement, the rocking movement and the music are independently controllable so that one may operate while the other or others are inoperative.

3,747,420

DRIVE MEANS FOR INTERVAL TIMER

Richard H. Weber, and Maurice E. Schuder, both of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

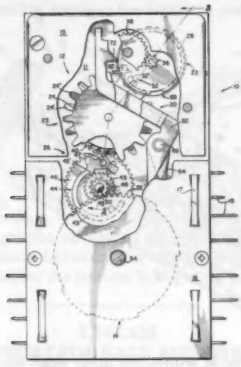
Continuation of Ser. No. 44,003, June 8, 1970, abandoned. This application Nov. 15, 1971, Ser. No. 199,071

Int. Cl. F16h *27/04*

U.S. Cl. 74—84 **9 Claims**

A gear is responsive to a cylinder rotating at constant speed through two sets of teeth with one of the sets having a thickness greater than the other. The cylinder includes an actuator engaging the teeth and also a peripheral recess to receive the set of teeth having the greater thickness. When the cylinder is in a position such that the recess is not aligned with

one of the teeth having the greater thickness, the cylinder prevents rotation of the gear.



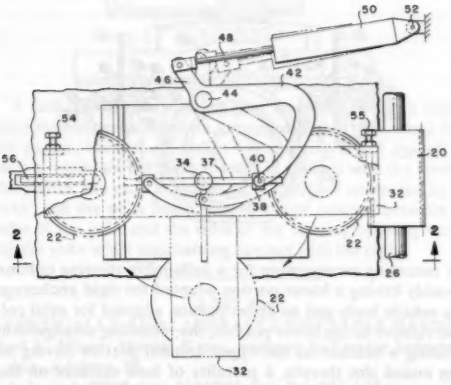
A first set of cams is responsive to the intermittent rotation of the gear, while a second cam is responsive to the constant speed rotation of the cylinder.

3,747,421

PACKAGE DOFFER MECHANISM

Paul W. Eschenbach, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 13, 1971, Ser. No. 188,919
Int. Cl. F16h *27/02*
U.S. Cl. 74—89 7 Claims



Improved mechanism to index a yarn package from the operative position to the inoperative position with a smooth motion to eliminate jerky starts and stops and vibratory movement therebetween.

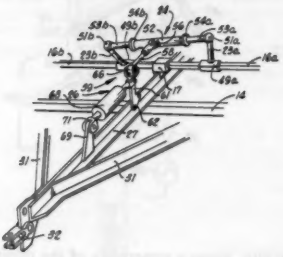
3,747,422

COMPENSATING LINKAGE

Eldon L. Rikli, R. R. 2, Waukomis, Okla.

Division of Ser. No. 815,989, March 16, 1971, Pat. No. 3,570,605. This application Feb. 19, 1971, Ser. No. 117,040
Int. Cl. F16h *21/44*
U.S. Cl. 74—99 9 Claims

The present invention envisions apparatus for rotating a pair of aligned shafts in equal arcs while allowing relative rotary motion of the shafts. In one embodiment, apparatus embodying the invention may comprise elongated linking means which has positioned on each end thereof a universal joint. An arm may be rigidly secured to each of the aligned rotary shafts and each of the arms thus secured may be operatively connected to one of the universal joints located at the end of the elongated linking means. A power assembly may be provided for moving the linking means in an arc about the parallel shafts thereby rotating the shafts. The power assembly is characterized by means for connecting a portion thereof with a central portion of the linking means in such a manner as to



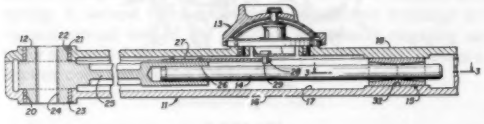
allow pivotal motion of the linking means relative to the power assembly. In addition, a portion of the power assembly is designed to allow limited universal motion of the elongated linking means about an axis normal to the longitudinal axis of the linking means.

3,747,423

TORQUE MEASURING WRENCH

Wallace F. Mitchell, Arlington Heights, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Nov. 17, 1971, Ser. No. 199,491
Int. Cl. B25b *23/14*
U.S. Cl. 73—139 4 Claims



A torque measuring wrench includes a spring bar interconnected between a socket and the wrench housing in which the socket is rotatably mounted, and an adjustably movable and lockable calibration block connects the spring bar to the housing.

ERRATUM

For Class 74—101 see:
Patent No. 3,747,148

3,747,424

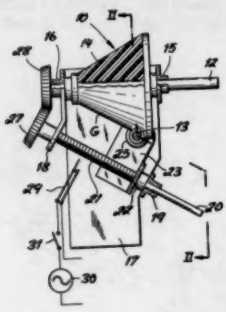
VARIABLE SPEED REDUCER

Kirill M. Alexeev, New York, N.Y., assignor to Jacques Gourevitch, New York, N.Y., a part interest

Continuation-in-part of Ser. No. 78,085, Oct. 5, 1970, abandoned. This application Feb. 28, 1972, Ser. No. 229,675
Int. Cl. F16h *1/16, 15/16*
U.S. Cl. 74—425.5 6 Claims

A worm rigid with an input shaft bites into the surface of a tapering elastomeric body (e.g. of neoprene), with straight or

arcuate generatrices, connected to an output shaft. The worm is journaled in a carriage which is displaceable, manually or automatically, along a generatrix of the tapering body to vary the step-down ratio between the two shafts.



3,747,425

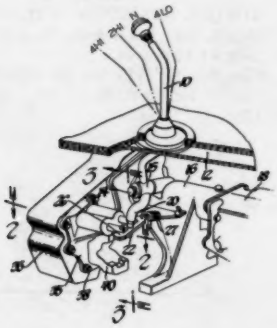
TRANSFER CASE WITH STRAIGHT LINE SHIFTER

Richard A. MacDonald, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 13, 1971, Ser. No. 179,950

Int. Cl. G05g 5/10, 9/00

U.S. Cl. 74—477 **5 Claims**



Controls for transfer case gearing in which a manual lever is moved in a straight path to predetermined stations operating a pair of shift rods, connected by interlock pins and cam surfaces, to condition transfer case gearing for four wheel high, two wheel high, neutral and four wheel low drive.

ERRATUM

For Class 74—6 see:
Patent No. 3,747,719

3,747,426

ADJUSTABLE STEERING COLUMN

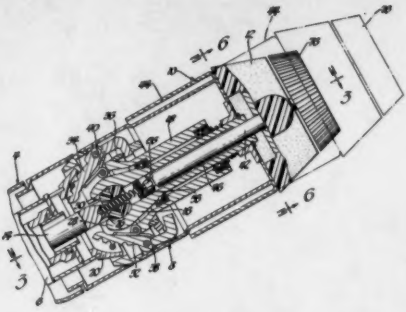
Floyd A. Schluckebier, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1971, Ser. No. 199,961

Int. Cl. B62d 1/18

U.S. Cl. 74—492 **1 Claim**

A telescopically adjustable automotive vehicle steering column includes improved telescopic adjustment locking means wherein a remote inner end portion of the inner of a pair of telescopically related steering shaft sections is formed with radially yieldable legs frictionally lockable with the outer shaft section under the pressure of forced inward projection of a push rod shiftable within the inner shaft section by steering wheel mounted actuating means.



3,747,427

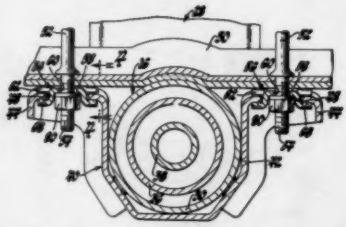
MOUNTING ARRANGEMENT FOR COLLAPSIBLE STEERING COLUMN

Thomas J. Milton, Bay City, and John W. Skelly, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 15, 1972, Ser. No. 253,401

Int. Cl. B62d 1/18

U.S. Cl. 74—492 **5 Claims**



A mounting arrangement for a collapsible steering column assembly having a lower portion adapted for rigid anchorage on a vehicle body and an upper portion adapted for axial collapse relative to the lower portion, the mounting arrangement including a bracket on the upper column portion having an open ended slot therein, a plurality of land surfaces on the bracket adjacent each longitudinally extending edge of the slot imparting to the edges progressively increasing thickness from the open end of the slot, a capsule adapted for rigid connection to the vehicle body and for sliding reception in the slot, and a plurality of integral resilient fingers struck from the body of the capsule and adapted to grippingly engage respective ones of the land surfaces on the bracket, the fingers generally simultaneously releasing the land surfaces upon initial collapse of the upper column portion.

3,747,428

MOTION TRANSMITTING ASSEMBLY

Donald W. Waner, Stow, and Roger F. Olsen, Cuyahoga Falls, both of Ohio, assignors to North American Rockwell Corporation, Pittsburgh, Pa.

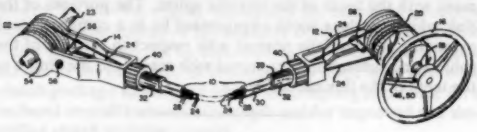
Filed Nov. 17, 1971, Ser. No. 199,548

Int. Cl. F16c 1/10; G01p 17/00

U.S. Cl. 74—496 **2 Claims**

A motion transmitting remote control assembly comprising a flexible conduit having an anchor fixedly attached to at least one of its ends, the conduit is attached at its anchor members

to frame members, motion transmitting members operatively connected to the frame. A core is axially movable in the conduit and is operatively connected to the motion transmitting members. The anchor engages the frame to prevent rotational



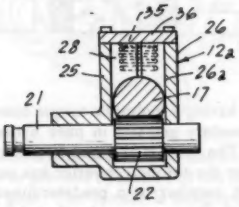
movement thereof. A tension adjusting device contacts the frame and engages the anchor to axially move the anchor to change the distance between the motion transmitting members to thereby adjust the tension in the core.

3,747,429

YOKE SUPPORT FOR RACK AND PINION GEAR

Richard Cass, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 9, 1971, Ser. No. 196,976
Int. Cl. B62d *1/20*
U.S. Cl. 74—492 **4 Claims**



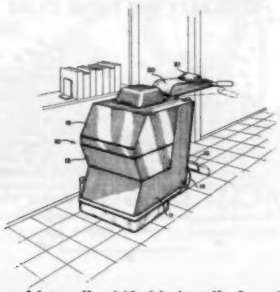
A rack and pinion steering gear assembly having a biasing yoke member positioned on the opposite side of the rack from the pinion, the yoke member being spring-urged against the rack to maintain the teeth thereof in contact with the teeth of the pinion, the rack having a curved surface contacted by the yoke, and the yoke being split to assure contact between the sides of the yoke and the sides of the housing opening receiving the yoke while maintaining contact with the rack.

3,747,430

VERTICALLY AND LATERALLY SHIFTABLE HANDLE

Earl L. Miner, Moran, Kans., assignor to Lawlor Industries, Inc., Addison, Ill.

Filed Apr. 21, 1972, Ser. No. 246,375
Int. Cl. G05g *1/04*
U.S. Cl. 74—523 **9 Claims**



A vertically and laterally shiftable handle for wheeled vehicles which can be vertically shifted, laterally shifted or shifted both vertically and laterally simultaneously.

3,747,431

SAFETY SHIFTING LEVER FOR THE TRANSMISSION OF MOTOR VEHICLES

Rudolf E. Uhlenhaut, Stuttgart-Riedenberg; Friedrich H. van Winsen, Kirchheim/Teck, and Hans Limmer, Korb Württemburg, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Feb. 18, 1971, Ser. No. 116,451
Claims priority, application Germany, Feb. 21, 1970, P 20 08 223.9
Int. Cl. G05g *1/04*
U.S. Cl. 74—524 **13 Claims**

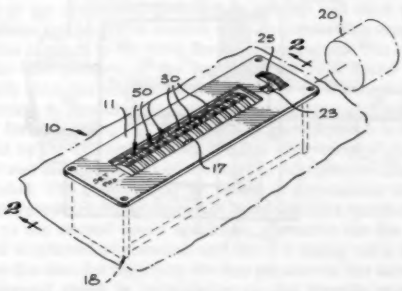
A safety shifting lever for the transmission of motor vehicles having two mutually displaceable telescopically guided lever parts. The two parts are normally maintained in a first position with respect to one another corresponding to normal shifting operations. Provisions are made for permitting relative axial displacement of the lever parts under the influence of axial pressure forces that are larger than the forces necessary for shifting the transmission. A first embodiment includes a compression spring interposed in hollow spaces within the lever parts for normally biasing the lever parts into the first position corresponding to normal use. A groove and annular spring detent arrangement is provided for retaining the two parts in a second collapsed position against the force of the compression spring. A second embodiment includes friction bushings arranged around one of the parts for frictionally engaging an inner surface of the other part. A third embodiment utilizes a friction cone connection between the two lever parts.

3,747,432

PROGRAMMER

Fred H. Cole, Newport Beach, Calif., assignor to Cole Instrument Corp., Placentia, Calif.

Filed Mar. 8, 1972, Ser. No. 232,879
Int. Cl. F16h *53/00*
U.S. Cl. 74—568 R **13 Claims**



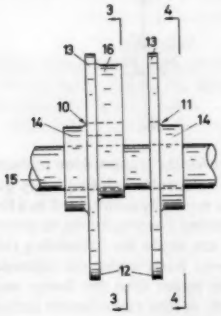
A drum programmer includes a plurality of individual cylindrical drum segments. Each drum segment is adapted to selec-

tively engage an actuating device as a preplanned function of the rotated position of the segment. For this purpose each segment has a plurality of spaced grooves formed in the peripheral surface of the segment parallel to the axis of the cylinder. Each groove has an actuating tab rotatively positioned therein. The tab is adapted to engage an actuating device when its peripheral surface portion is proximate the device in a first stable rotated tab position. Means are also provided for supporting each tab in its respective groove in a second non-engaging stable rotated position. Any number of individual drum segments may be mounted in a coaxial manner to provide a programmer adapted to activate any desired number of actuating devices.

3,747,433
CRANKSHAFTS OR THE LIKE

Charles Vivian Crowe, 161 Cambridge Rd., Hamilton, New Zealand

Filed Nov. 26, 1971, Ser. No. 202,244
Int. Cl. F16c *3/10*
U.S. Cl. 74—598 **8 Claims**

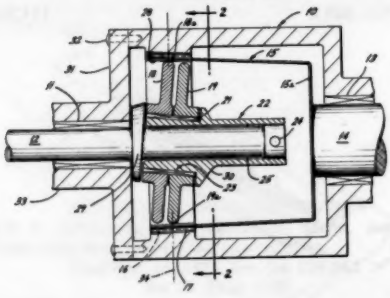


A crank unit comprising a pair of mutual or co-acting disc-like members, each member having a central hole for a mounting shaft, the members being spaced apart by a circular flange affixed to one or both members, and the flange being arranged eccentrically about the central hole axis.

3,747,434
HARMONIC DRIVE

Paul H. Stahlhuth, Mission Viejo, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Sept. 10, 1971, Ser. No. 179,446
Int. Cl. F16h *35/00, 1/28*
U.S. Cl. 74—640 **6 Claims**

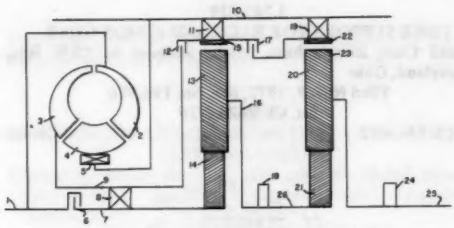


A harmonic drive including a strain wave generator for urging the teeth of a flexible spline into rolling, progressive engagement with the teeth of a circular spline. A pair of circular disks are so rotatably mounted as to cause a predetermined portion of one disk to urge a portion of the teeth of the flexible spline into engagement with the teeth of the circular spline, while a diametrically opposed portion of the other disk urges another portion of the teeth of the flexible spline into engagement with the teeth of the circular spline. The portions of the disk which produce tooth engagement lie in a common plane extending substantially normal with respect to the axis of the splines and substantially centered with respect to the length of the teeth of the flexible spline.

3,747,435
TRANSMISSION

Arthur L. Welch, Star Route, Wasilla, Alaska

Filed June 9, 1971, Ser. No. 151,346
Int. Cl. F16h *47/68*
U.S. Cl. 74—688 **2 Claims**

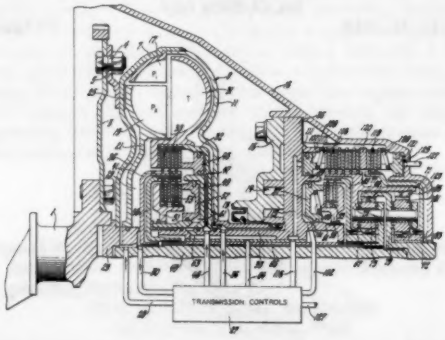


A transmission having a hydraulic torque converter driving a plurality of planetary gearsets in pure hydraulic drive in starting position. The drive is changed to part hydraulic part direct driven when the torque converter has accelerated the first gearset input member to a predetermined speed. The hydraulic drive of the torque converter then drives the gearset reaction members, and the engine shaft which drives the torque converter directly drives the first gearset input member. Since the gear ratio in the planetary gearsets drops when the torque converter accelerates the reaction member the gearsets are driven successively through a range of ratios ranging from maximum reduction to direct drive.

3,747,436
POWER PACKAGE

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Electric Corporation, Detroit, Mich.

Filed June 28, 1971, Ser. No. 157,235
Int. Cl. F16h *45/00, 47/08;* **F16d** *33/02*
U.S. Cl. 74—730 **8 Claims**



The engine drives a variable capacity fluid coupling operatively connected to a four-speed forward and one-speed

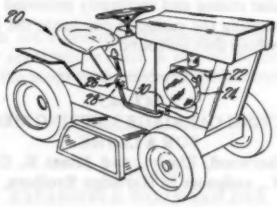
reverse planetary gear unit. Controls are provided for changing the capacity of the coupling for improved transmission operation. For initially moving a vehicle using this transmission, the capacity is reduced to unload the engine so that it may rapidly accelerate to higher speeds for a rapid increase in power. To prevent engine racing and for improved economy of subsequent operation the capacity is then increased so that full engine torque can be absorbed by the coupling and transmitted to the gear unit. In this invention there is an advanced clutch package submerged within the coupling to provide for a reduced overall transmission length and for improved and simplified clutch package control.

3,747,437

ENGINE AND TRANSMISSION WITH SAFETY SYSTEM

Hans Hauser, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Apr. 22, 1971, Ser. No. 136,510
Int. Cl. B60k *27/00*
U.S. Cl. 74—850 **6 Claims**



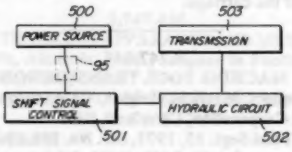
This invention relates to an engine and a transmission with a safety system to prevent operation of the engine if the transmission is in gear. The system is designed so that a switch operated by shift means of the transmission is closed when the transmission is in neutral and open when it is in gear. The engine is prevented from starting whenever the switch is in the open position. The switch is preferably mounted in the transmission housing so as to be precisely located with respect to the shift mechanism and thereby assure that the position of the switch is reliably coordinated with the shift mechanism and the position of the transmission. By mounting the switch within the transmission housing, it is also protected from dirt and physical damage and does not interfere with the operator.

3,747,438

SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Eiji Toyoda; Shin Ito, and Seitoku Kubo, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Continuation-in-part of Ser. No. 889,062, Dec. 30, 1969, abandoned. This application Mar. 28, 1972, Ser. No. 238,773
Int. Cl. B60k *21/00*; F16h *57/10*
U.S. Cl. 74—866 **26 Claims**



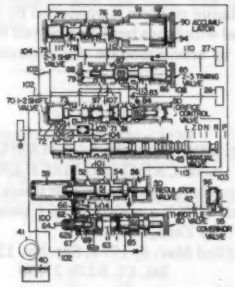
Improved shift control of the present invention is used in an engine driven vehicle having an automatic transmission. Load indicating apparatus responds to the operational load characteristics of the vehicle and produces outputs indicative of variations therein, while a responsively coupled first shift point computing apparatus effects the gear change signal for the transmission when the output indicates a certain load characteristic. A second shift point computer is responsively coupled to the load indicator and provides an output of a gradient operating circuit thereof in order to establish a gear change signal when the output of the load indicating apparatus establishes that a certain load characteristic exists which is corelative to a gradient exceeding a selected amount.

3,747,439

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

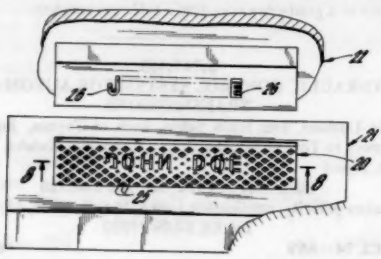
Sumio Uozumi, and Ichio Sakai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed May 5, 1971, Ser. No. 140,328
Claims priority, application Japan, May 9, 1970, 45/39435
Int. Cl. B60k *21/00*
U.S. Cl. 74—869 **6 Claims**



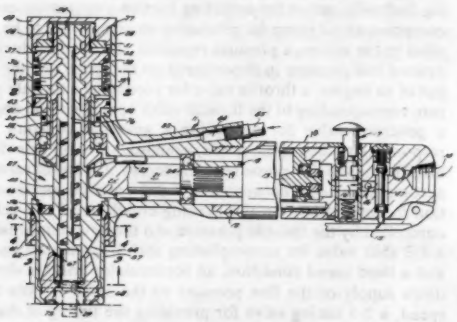
A hydraulic control system for automatic transmissions having hydraulic servos for actuating friction engagement means comprises an oil pump for producing an oil pressure to be supplied to the servos, a pressure regulator valve for producing a desired line pressure in dependence on the speed and the output of an engine, a throttle valve for producing a throttle pressure corresponding to the throttle valve opening of the engine, a governor valve for producing a governor pressure corresponding to the engine speed, a manual valve for selectively distributing the line pressure to the servos, a 1-2 shift valve for accomplishing shift between a first and a second speed condition in dependence on the running condition of the vehicle controlled by the throttle pressure and the governor pressure, a 2-3 shift valve for accomplishing shift between the second and a third speed condition, an accumulator unit for slowing down supply of the line pressure to the servo for the third speed, a 2-3 timing valve for providing the timing of the upshift or the down-shift between the second and third speed condition and an orifice control valve for controlling supply of the line pressure to the servo for the second speed. The supply of the line pressure to the servo for the third speed upon upshift from the second speed condition to the third speed condition is slowed down by the accumulator unit and the time for exhausting the servo for the second speed is determined by the 2-3 timing valve whereby an overlap of engagement and disengagement of the friction engagement means is provided. The overlap may be varied in dependence on the throttle pressure. Upon downshift from the third speed condition to the second speed condition, the servo for the third speed is relieved of pressure, and the 2-3 timing valve determines the time for supplying the line pressure to the servo for the second speed in dependence on the throttle pressure. Further the orifice control valve controls flow of the line pressure so that a desired overlap may be provided as in the case of upshift.

3,747,440
PREPARING MASTER PATTERN FOR PRODUCING CASTED RAISED FIGURES
Thomas M. Camilleri, 277 Ave. W., Brooklyn, N.Y.
Filed Oct. 5, 1971, Ser. No. 186,690
Int. Cl. B21k *5/20*; B23p *25/00*
U.S. Cl. 76—107 R **8 Claims**



A master pattern for the casting of raised figures such as lettering on a plaque or plate is produced by hobbing the figures into a material which has been preformed with suitable void or open spaces to accommodate the material displaced during hobbing.

3,747,441
PNEUMATIC TOOL HAVING COMBINED NUT RUNNING AND CRIMPING MECHANISM
Lester A. Amtsberg, Utica, and William K. Wallace, Barneveld, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Mar. 8, 1971, Ser. No. 121,867
Int. Cl. B25b *27/00*
U.S. Cl. 81—10 **12 Claims**

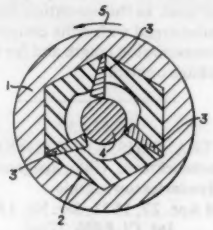


A nut running tool in which is combined nut running and nut crimping mechanism. The tool is operative to crimp all six sides of a standard hexagonal nut. A reversible rotary air motor drivingly connected with the mechanism is operable in one direction to cause the mechanism to drive the nut to a predetermined tightness, and is operable in an opposite direction to cause the mechanism to crimp the nut.

In one embodiment, control means is selectively operable to determine the direction of rotation of the motor.

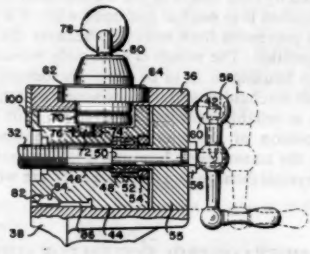
In a second embodiment, control means is provided which is operable without further intervention of the operator to cause the mechanism to run through a first stage to set the nut, then responds automatically to setting of the nut to cause the mechanism to crimp the nut, and finally responds to the latter action to restore the tool to its normal condition.

3,747,442
CHUCKS
Paul Gilger Rausch, Cleveland, Ohio, assignor to Celtite, Inc., Cleveland, Ohio
Filed July 27, 1971, Ser. No. 166,544
Int. Cl. B25b *13/50*
U.S. Cl. 81—53.2 **1 Claim**



A chuck for driving bolts into holes with rotation consists of an outer tubular casing and resiliently mounted jaws therein, such that on turning the casing in one sense the jaws grip and turn any bolt which they surround.

3,747,443
QUICK ACTING CARRIAGE SHIFTING MECHANISM FOR A LATHE
Charles D. Sherwood, Elmira, and James R. Cordier, Erin, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.
Filed June 24, 1971, Ser. No. 156,247
Int. Cl. B23b *21/00*
U.S. Cl. 82—24 R **11 Claims**

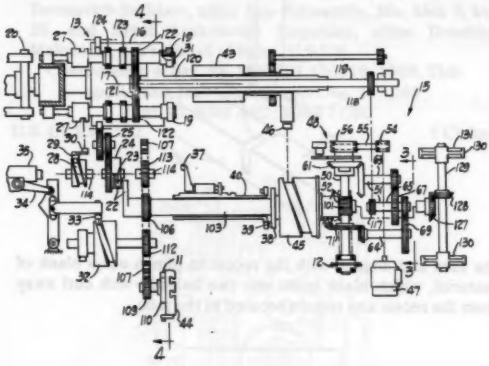


A quick acting carriage shifting mechanism for a lathe comprising a pair of rotary operators having their axes of rotation at substantially right angles to each other, a feed screw shaft for connection with the carriage for moving the carriage back and forth, the feed screw shaft being both rotatable and translatable about a longitudinal axis, one of the operators being mounted on the shaft for only rotating the shaft for slow, incremental movement of the carriage, and the other operator being mounted for only translatory shifting of the shaft for fast movement of the carriage.

3,747,444
MACHINE TOOL TRANSMISSION
Karl P. Schubert, Mayfield Heights, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio
Filed Sept. 15, 1971, Ser. No. 180,696
Int. Cl. B23b *19/02*, *3/34*
U.S. Cl. 82—28 R **17 Claims**

A transmission for a multiple spindle automatic machine tool is disclosed. A motor is mounted crosswise in the base of the machine and drives a single cross shaft in the machine.

One end of the cross shaft is journaled in bearings which perform double duty of also journaling the inputs to a clutch and brake unit. The foregoing is merely a resume of one general



application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,747,445

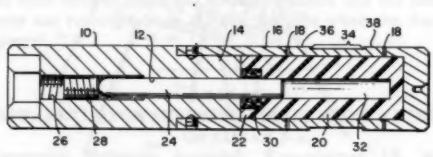
EXPANSIBLE WORK HOLDER

Charles Piotrowski, 10459 Bertram, Dearborn, Mich., and Paul T. Waite, 1907 Rosemont, Berkley, Mich.

Filed May 6, 1971, Ser. No. 140,815

Int. Cl. B23b *31/40*

U.S. Cl. 82—44 **28 Claims**



An expansible work holder including a deflectable shell, an expansible insert lining the interior of the shell, a single fluid chamber defined at least in part by the insert, and means for establishing fluidic pressure within said chamber. The pressure establishing means may include a device for adjusting expansion of the holder prior to insertion of the holder into the workpiece and a device for expanding the holder after such insertion. The shell may have selected portions of a different size than the remainder of the shell for aiding the force fit of the holder within the workpiece.

3,747,446

PIPE TRACKING APPARATUS AND METHOD

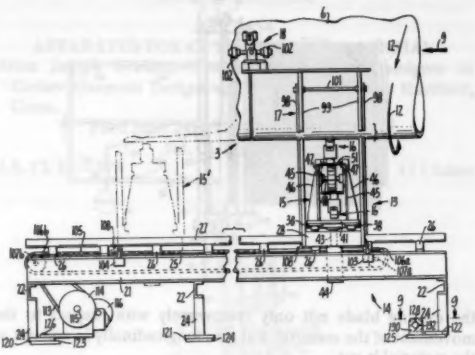
Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Filed May 17, 1971, Ser. No. 143,811

Int. Cl. B23b *37/00*

U.S. Cl. 82—53.1 R **9 Claims**

Pipe tracking apparatus and method and cutoff apparatus and method incorporating same, for pipe traveling longitudinally in a direction and rotating about its longitudinal axis. A tracking carriage mounts pipe engaging means having pipe engaging portions each adapted for engaging the pipe for a sustained interval. The carriage is moved a predetermined distance with the pipe at the rate of travel thereof in such



direction, as the pipe engaging portions successively effect a pipe engaging relationship with the pipe. The carriage supports a pipe cutoff tool.

3,747,447

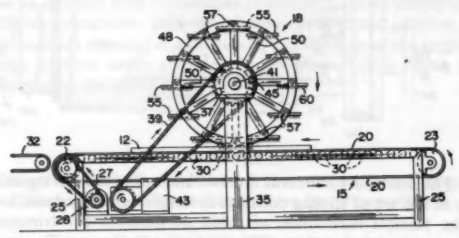
ORBITAL PERFORATOR

Louis M. Wisner, Largo, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Apr. 26, 1971, Ser. No. 137,202

Int. Cl. G26f *1/24*

U.S. Cl. 83—2 **4 Claims**



A novel perforating apparatus is provided in which a series of sequentially, orbitally moving perforating segments are applied with vertical and horizontal compronents of movement to a work piece so that each of a plurality of individual perforating elements mounted on the segments reciprocates in a direction perpendicular to the upper face of the work piece throughout its stroke.

3,747,448

RECIPROCATING CUTTING APPARATUS

Angelo F. Carbone, Brooklyn, N.Y., assignor to Emmanuele Fallacaro, Commack, N.Y., a part interest

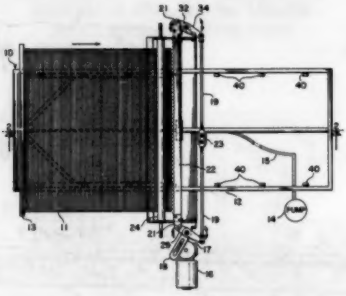
Filed Dec. 29, 1971, Ser. No. 213,355

Int. Cl. B26d *3/28*; B23d *51/02*

U.S. Cl. 83—4 **3 Claims**

A reciprocating cutting apparatus particularly suited for cutting bulk materials, consisting of an elongated longitudinally tensioned cutting blade disposed across a material carriage, and coupled at one end to a reciprocating power source. The blade is tensioned against sagging so the bulk material,

such as honeycomb structures, can be sliced at even depths across its entire width. The reciprocating power source moves



the cutting blade not only transversely with respect to the movement of the material, but also longitudinally in and out as the material is cut.

3,747,449

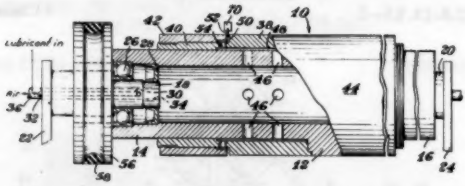
SLITTING DEVICE AND METHOD

Gordon E. Gould, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1972, Ser. No. 240,940

Int. Cl. B23d *19/04*

U.S. Cl. 83—22 **10 Claims**



The disclosure concerns method and apparatus having utility in the art of slitting continuous lengths of film, sheet, and like flexible web materials, and particularly for trimming waste edge(s) therefrom. The apparatus in the specific structure illustrated, embodies: a hollow trim cylinder **12** rotatably driven such as by belt means **58**, and which receives an advancing web **78**, a groove **50** continuous on the surface of revolution of such cylinder and in communication with the interior thereof, a stationary slitting blade **52** which rides in such groove, and passage means **34** for introducing air or like fluid internally to the cylinder, for flow of the same outwardly of groove **50** against the underside of the web. In practicing the method, the trim cylinder is driven at a rate generally corresponding to or in excess of that of web **78**.

3,747,450

METHOD OF PERFORATING TUBES

Leslie Gordon Hudson, Little Capped Hall, Epping, Essex, England

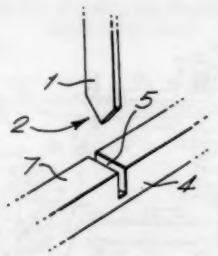
Filed Aug. 27, 1971, Ser. No. 173,513

Claims priority, application Great Britain, Aug. 20, 1970, 40,393/70

Int. Cl. B26d *3/00*

U.S. Cl. 83—30 **2 Claims**

The invention relates to a method for forming slots in a section of a tube of rectangular section comprising inserting a die into the tube, the die having a width less than that of the tube and having a recess open on three faces extending across the die, a punch with a rectangular perforating portion perforating



the tube and aligned with the recess to punch out a blank of material, which blank splits into two halves which curl away from the recess and remain secured to the tube.

3,747,451

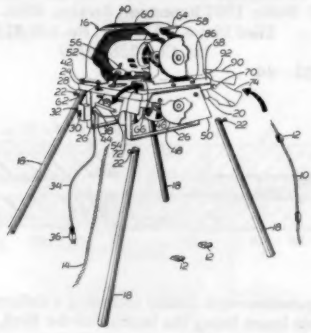
MACHINE AND METHOD USED TO REMOVE LEAD WEIGHTS SWAGED ON ROPE LINES OF FISHING NETS AT SPACED INTERVALS

Richard E. Gaffney, 4212 N. 19th St., Tacoma, Wash.

Filed Apr. 13, 1971, Ser. No. 133,504

Int. Cl. B26d *3/28*; B65h *27/00*

U.S. Cl. 83—51 **6 Claims**



Some rope lines used with fishing nets have spaced apart swaged-on lead weights. After some extensive use, these leaded ropes are replaced. This machine and method are utilized to quickly and conveniently remove the lead weights from rope lines without damaging the rope to be used again for other purposes, and without losing any substantial portions of the lead to be melted, formed, and swaged again.

The rope with swaged-on leads is drawn into the machine and continuously pulled through, leaving as a non leaded rope. Within the machine, revolving circular saws are adjustably spaced apart on opposite sides of the rope. The leaded rope is drawn through adjustable and resiliently positioned guides locating the moving rope midway between the revolving circular saws by controlling the path followed by each swaged-on lead weight which often because of the swaging process differs somewhat in its outside shape from either the preceding or following swaged-on lead weight. Although the swaged on weights differ somewhat in exterior shape, the saws are adjusted to slice through only the lead which then falls clear of the passing rope, as the adjustable guides still function after their initial setting to further compensate for the remaining comparatively minor exterior size changes of the swaged-on lead weights.

3,747,452

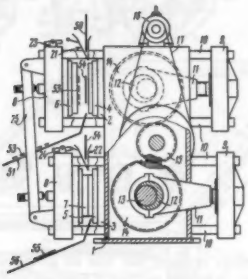
AUTOMATIC PRESS FOR DIE BLANKING OF TWO CONCENTRIC PARTS FROM STEEL STRIPS

Vitaly Konstantinovich Gilev, 811 proezd, 65, kv. 16; Volf Nakhimovich Evzlin, ulitsa Chapaeva, 102, kv. 53; Rafael Tevosovich Sarkisov, ulitsa Aga-Neimatully, 20a, blok 3, kv. 28, and Ernst Arakelovich Stepanian, ulitsa Druzhby Molodezhi, 2, kv. 36, all of Baku, U.S.S.R.

Continuation of Ser. No. 865,358, Oct. 10, 1969. This application Jan. 12, 1972, Ser. No. 217,305

Int. Cl. B26f *1/02*; B26d *11/00*

U.S. Cl. 83—132 7 Claims



An automatic press for die blanking two concentric parts from a steel strip. The press is provided with compound dies whose blanking surfaces are arranged vertically, the dies being positioned one above the other. The punches of the dies are secured on slides articulated to provide reciprocal movement in opposite directions. There are also feed devices provided above the respective dies for the periodic feed by gravity of workpieces to the upper dies and of central portions blanked in the upper die to the lower dies. A mechanism is coordinated with the slide movement so that the workpieces are fed from the feed devices when the dies are opened and the finished parts are removed from the die punches when the dies are opened.

3,747,453

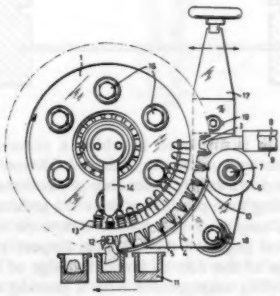
APPARATUS FOR SEVERING PIECES FROM A STRING OF SUGAR

Conrardus Hubertus Aquarius, Kanaalstraat 13, Weert, Netherlands

Filed Nov. 3, 1971, Ser. No. 195,412

Int. Cl. B23d *25/02*; 26d *1/56*; B26d *7/18*

U.S. Cl. 83—117 3 Claims



The invention disclosed relates to an apparatus for severing individual pieces of candy from a deformable string thereof. The apparatus is characterized by severing means having a plurality of knives which extend from the peripheral outer surface of a cylinder, and which cooperate with an impressible resilient roller for effecting severing of candy pieces. Use of the present apparatus permits cutting of candy such that there is no waste of material.

3,747,454

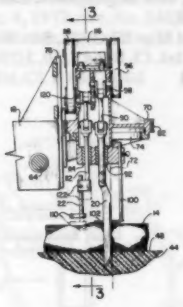
APPARATUS FOR CUTTING SHEET MATERIAL

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Incorporated, East Hartford, Conn.

Filed June 24, 1971, Ser. No. 156,421

Int. Cl. B26d *7/02*

U.S. Cl. 83—375 11 Claims



Apparatus which translates a cutting blade along a cutting path through a layup of sheet material on a support table includes a tamping member which follows the cutting blade along the cutting path. The tamping member is driven in a reciprocating or vibratory manner to return the upper plies of the layup at opposite lateral sides of a cut to their original, flattened position from the peaked positions acquired during the cutting operations. With the plies in the flattened position, a subsequent crossing of a previously cut segment of the cutting path is more easily accomplished without further lifting or dislocating the upper plies.

3,747,455

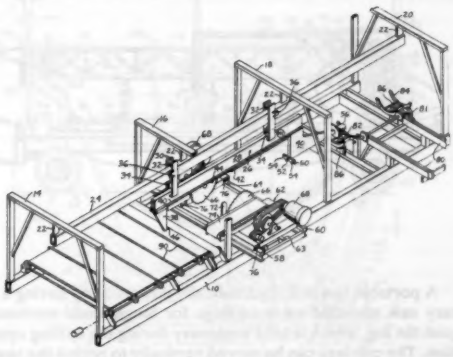
SAWMILL

George W. Hartzell, and Robert J. Gunnerman, both of Piqua, Ohio, assignors to Hartzell Industries, Inc., Piqua, Ohio

Filed June 14, 1971, Ser. No. 152,751

Int. Cl. B27b *7/00*, *29/10*

U.S. Cl. 83—403.1 19 Claims



The specification discloses a sawmill arrangement in which a log carriage is provided which is suspended from a horizontal rail located above the carriage with the log being suspended on the carriage therebeneath. The carriage has

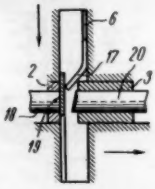
dogging elements thereon to engage the ends of the log and which are rotatable for turning the log. Controls are provided for controlling the reciprocation of the log carriage and the feeding of the saw toward and away from the path of the log. Two saws may be employed, one running on each side of the center of the mill for cutting slabs or boards from both sides of the log. Each saw may have associated therewith edging saws for edging the slabs or boards taken by the main saws of the machine.

3,747,456

DEVICE FOR CUTTING ROLLED PRODUCTS

Alexei Vladimirovich Kochinashvili, and Tenaiz Alexeevich Kochinashvili, both of prospekt I. Chavchavadze, 51, kv. 24, Tbilisi, U.S.S.R.

Filed Mar. 22, 1972, Ser. No. 237,136
Int. Cl. B26d 3/20, 5/20, 7/02
U.S. Cl. 83—404 **1 Claim**



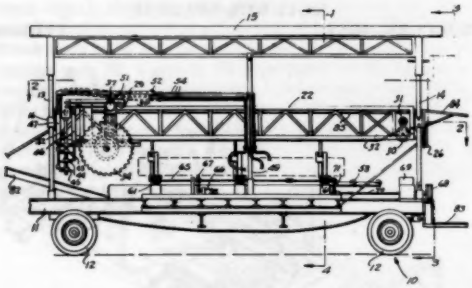
A device comprising a bottom and top cutting plates interconnected with the aid of a rigid joint, arranged parallel to each other and allowed to reciprocate in the cutting plane between two split guide sleeves, one of which is stationary and the other travels along the axis of rolled products with the sleeves encompassing and directing the rolled products (bars) into the cutting zone and with each sleeve fitted with clamps to locate the bars during the cutting process.

3,747,457

PORTABLE SAW MILL

Eldon K. Thompson, 1424 S. 4th St., Dayton, Wash.

Filed Jan. 28, 1972, Ser. No. 221,641
Int. Cl. B27b 7/02
U.S. Cl. 83—471.2 **9 Claims**



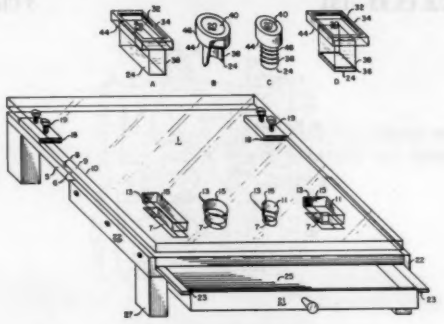
A portable saw mill, hydraulically powered and having a rotary saw mounted on a carriage for longitudinal movement past the log, which is held stationary during the cutting operation. The carriage can be moved vertically to permit the saw to clear a new log as it is moved onto the saw table. Edging saw blades are carried by the carriage to trim the side edges of the board as it is being cut from the log by the rotary saw. A conveyor is provided for moving the sawn boards away from the saw with this conveyor being reversible to move the slabs to the slab pile as they are removed from the log. A log conveyor is provided for moving the logs into position on the saw table for cutting.

3,747,458

PUNCH AND DIE ASSEMBLIES

Stanley A. Brown, R.F.D. No. 1, Lebanon, N.H.

Filed Aug. 17, 1970, Ser. No. 64,204
Int. Cl. B26d 7/00
U.S. Cl. 83—520 **11 Claims**



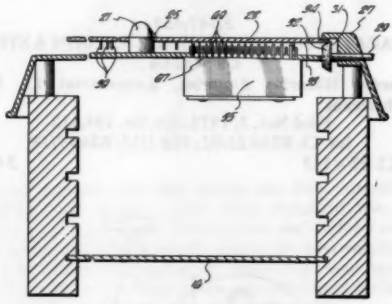
There is described a punch and die assembly for sheet materials which provides the operator with the ability to visually index the material to be punched.

3,747,459

MUSICAL TOY

Gerald W. Schmidt, Woodland Hills; Lawrence Temple Jones, and Jay Smith, III, both of Pacific Palisades, all of Calif., assignors to California R & D Center, Pacific Palisades, Calif.

Filed Feb. 2, 1972, Ser. No. 222,809
Int. Cl. G10f 1/06
U.S. Cl. 84—94 R **15 Claims**



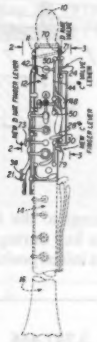
A musical toy is disclosed in which a removable disc is rotatably driven by a manually operated friction wheel. The disc comprises downwardly extending protrusions for actuating corresponding tone producing tines of a musical comb in a predetermined sequence to produce a desired melody. The friction wheel is angularly biased with respect to the lower peripheral edge of the disc to force the edge of the disc upwardly into sliding engagement with a bearing surface and inwardly to enable the inner edge of the disc to bear against the spindle. In this manner, the friction wheel maintains a wedged grip on the disc during rotation. The tines of the musical comb are angularly oriented with respect to the travel of the disc to lower the force required of the protrusions for actuating the tines. The comb is supported between two knife edges for better support in order to produce clearer tones.

3,747,460

CLARINET

Jack W. Robbins, 6340 N. Wayne Ave., Chicago, Ill.

Filed Dec. 1, 1972, Ser. No. 311,407
Int. Cl. G10d 7/06
U.S. Cl. 84—382 2 Claims



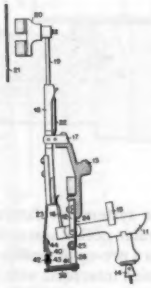
A clarinet designed to use the Boehm system of fingering has in addition to a second B and an added C-natural hole with means for controlling said holes with the left hand (all as disclosed in my prior U. S. Pat. No. 3,526,165 dated Sept. 1, 1970) and has in addition a D-natural hole and a C-sharp hole, together with left hand control means therefor. The effective musical range for left hand operation is thereupon increased to about one and one-half octaves.

3,747,461

PIANO ACTION WITH SOSTENUTO MECHANISM

Akira Yui, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Apr. 14, 1972, Ser. No. 244,045
Claims priority, application Japan, Apr. 19, 1971, 46/24560; Apr. 26, 1971, 46/26682
Int. Cl. G10c 3/00
U.S. Cl. 84—218 18 Claims



In a piano action, a damper lever, pivoted intermediate thereof and with its damper biased toward the string, has a tab portion extending in the side opposite to the damper side. A sostenuto block, rotatably supported beside the tab portion, has a lip portion rotatable against a biasing force and resting on a stop. The rotation of the block causes the lip portion to come near and away from the tab portion. When the block is rotated while the damper is brought away from the string upon depression of the key, the lip portion catches the tab portion and prevents the damper from coming into contact with the string even after release of the depressed key so long as the block is in a rotated position, thus permitting the string struck by the hammer to continue its vibration so that a sustaining tone is obtained.

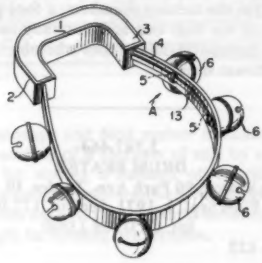
A plurality of such sustenuto blocks for a plurality of damper levers are fixed to a transversely extending rockable rail, so that the rail rotates all of the blocks at one time. When the damper levers other than the one which the lip portion has caught are to be rotated while all of the blocks are in rotated position, the damper levers to be rotated are permitted their rotation by their tab portions pushing and rotating the corresponding lip portions against the biasing force imparted thereto.

3,747,462

MUSICAL INSTRUMENT WITH BELLS

Tsugio Mizuno, Tokyo, Japan, assignor to Kabushiki Kaisha Koishikawa Shokai, Yokkaichi, Japan

Filed Apr. 4, 1972, Ser. No. 240,987
Claims priority, application Japan, May 11, 1971, 46/36971 (utility model)
Int. Cl. G10d 13/08
U.S. Cl. 84—406 7 Claims



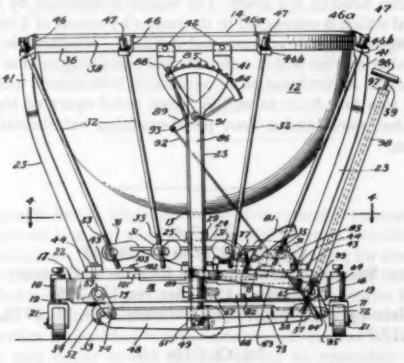
A musical instrument comprises a bell supporting belt having a plurality of spaced apertures provided therein, a plurality of bells disposed on one side of said bell supporting belt and each having a fitting part formed in a closed loop, said fitting part of each of said bells projecting through and outwardly of the associated one of said apertures provided in said bell supporting belt, and a through belt disposed along the other side of said bell supporting belt and penetrating through said closed loops formed by said fitting parts.

3,747,463

MUSICAL INSTRUMENT OF THE PERCUSSION TYPE

Fred D. Hinger, 357 Hilltop Ave., Leonia, N.J.

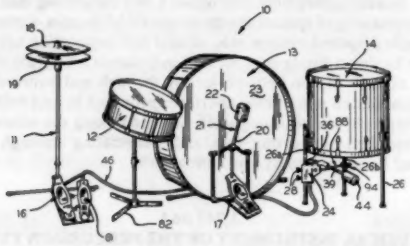
Filed Aug. 14, 1970, Ser. No. 63,692
Int. Cl. G10d 13/04
U.S. Cl. 84—419 16 Claims



Percussion instruments, typically kettledrums, are disclosed, wherein a plurality of adjustments are provided for,

notably by a construction wherein a percussion head is carried on the drum and is subject to be variably tensioned; a plurality of tension members are disposed in spaced-apart relation peripherally of the drum and interconnect said head and a master tuning member; there being a pitch control for said member, disposed for ready access by a player at a given location, and having a mounting pivot at said location, and coupled to said master tuning member whereby to actuate the tension members in unison and vary the tension on the percussion head; and a supplemental fine tuning adjuster is disposed for ready access by the player at the same location; and, in typical embodiments, the instrument includes a base, and a frame mounted on the base for rotation relative thereto about the drum axis and having means supporting the drum so that rotation of the frame carries the drum and head therewith; and in the preferred arrangement there is a drum rotating control disposed at a location for ready operation by the player, comprising a motion-reducing mechanism, said mechanism preferably having an irreversible connection. Other features are shown, in combination with one or more of the foregoing, such as: a pitch indicator observable by the player, individual adjustments for the tension members, a foot-pedal pitch control pivoted at the heel end and normally set at a moderate angle to the horizontal, and means whereby the construction drums of different sizes.

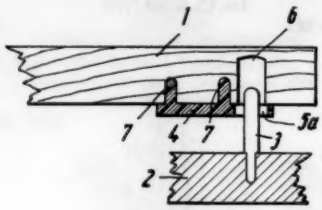
3,747,464
DRUM BEATER
Robert Louis Russell, 90 Park Ave., Justice, Ill.
Filed Sept. 1, 1971, Ser. No. 177,051
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 **1 Claim**



A floor mounted tom tom drum having a drum beater mounted on one of the vertical legs thereof for beating the bottom head of the drum. The beater is actuated by a foot pedal which is connected to the beater by means of a resilient spring-like hard-surfaced substantially inextensible wire member carried within a flexible self-sustaining tubular guide member. A combination of percussion instruments including said tom tom drum as well as a foot pedal-operated high hat cymbal stand and a foot pedal-operated side-beater base drum.

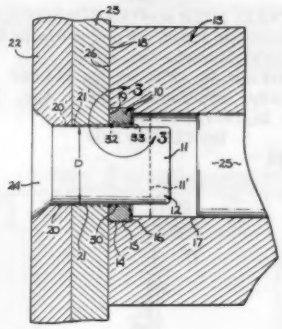
3,747,465
KEYBOARD INSTRUMENT
Rainer Schutze, Muehltalstr. 128, Heidelberg, Germany
Filed Feb. 3, 1972, Ser. No. 223,205
Claims priority, application Germany, Feb. 11, 1971, G 71 05 117.7
Int. Cl. G10c *3/12*
U.S. Cl. 84—436 **11 Claims**

Keys in a keyboard instrument can be depressed in a predetermined path and have secured to them a guide member of synthetic plastic material for movement with the keys, each guide member having an elongated slot which extends longitudinally of the respective key and into which one



guide pin mounted adjacent to the key extends with an end portion so as to guide the key during movement as it is being depressed or returns to its initial position.

3,747,466
RIVET FASTENER SYSTEM
Irwin E. Rosman, 23710 Clarendon Street, Woodland Hills, Calif.
Continuation-in-part of Ser. No. 798,039, Feb. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 688,416, Dec. 6, 1967, Pat. No. 3,426,641. This application June 19, 1970, Ser. No. 47,825
Int. Cl. B21d *39/00*; B23p *11/02*; F16b *19/04*
U.S. Cl. 85—37 **8 Claims**



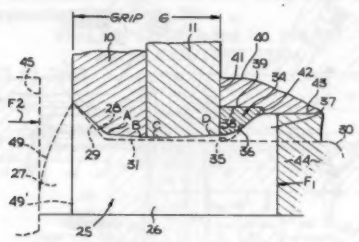
A rivet fastener system for fastening together structural members. An annular collar surrounds the end of a ductile rivet shank and has a pre-upset orifice comprising a cylindrical surface portion which intersects with another surface portion, the intersecting surface portions being at an angle to one another which may be 90° and being connected by an orifice outer corner of small radius of curvature. During rivet upset, the end of the rivet shank and collar are plastically deformed to produce a new orifice surface which facilitates flow of shank material therethrough. The cylindrical surface portion can also initially form with the inside surface portion, an orifice inner corner having a small radius of curvature. The initial collar configuration has small blend corner radii with improved tensile capability and can be used with ductile rivet materials. In cases of highly ductile rivet material, the radius of curvature of the orifice corners can be zero (or sharp). The major objectives are the reversibility of installation of the collar adjacent the structure and low manufacturing costs associated with simplified orifice shape.

3,747,467

RIVET FASTENER SYSTEM AND METHOD

Irwin E. Rosman, 23710 Clarrendon Street, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 15,363, March 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 755,994, Aug. 28, 1968, abandoned, which is a continuation-in-part of Ser. No. 688,416, Dec. 6, 1967, Pat. No. 3,426,641.
This application May 20, 1971, Ser. No. 145,191
Int. Cl. B21d *39/00*; B23p *11/02*; F16b *19/04*
U.S. Cl. 85—37 32 Claims



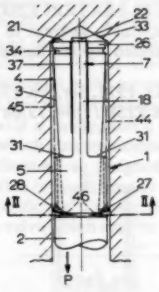
A rivet fastener system and method which controls the interference fit of the upset shank of a rivet in structural sheets, the rivet having a crowned, (dome shaped) manufactured head of selected volume at one end of its shank, and a forming collar around the opposite, upset head end of the shank. A substantially uniform interference fit gradient of the required magnitude is obtained to provide extended fatigue life of the structure at the joint.

3,747,468

ANCHOR BOLT

Johan Wilhelm Jansen, and Hendrik Hoffman, both of Hilversum, Netherlands, assignors to Huygmetal N.V., Hilversum, Netherlands

Filed Nov. 10, 1971, Ser. No. 197,315
Claims priority, application Netherlands, Nov. 12, 1970, 7016529; Jan. 27, 1971, 7101034
Int. Cl. F16b *13/06*
U.S. Cl. 85—79 8 Claims



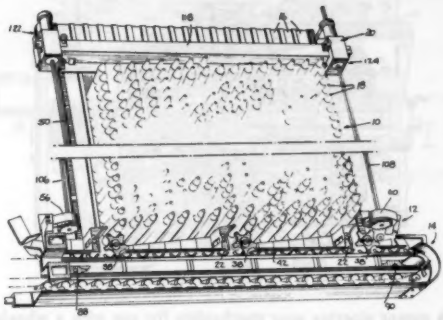
An anchor bolt assembly of the type wherein expansion members are slidably mounted on an expansion portion of the bolt by means of a brace interconnecting the expansion members and passing over the bolt end. The expansion members have the shape of wings stamped together with the brace legs and its base from one piece of sheet material. The brace base engages the end face of the bolt. The wings collectively encircle the greater part of the circumference of the conical expansion bolt portion. Hook means formed by bent rear corners of rear wing parts extend beyond the bolt circumference in an outward-backward direction.

3,747,469

LINEAR LINKLESS AMMUNITION FEED SYSTEM

Eugene Ashley, Burlington, and Douglas P. Tassie, St. George, both of Vt., assignors to General Electric Company, Burlington, Vt.

Continuation of Ser. No. 826,814, May 22, 1969, abandoned.
This application Apr. 12, 1971, Ser. No. 158,704
Int. Cl. B65g *37/00*, *47/06*; F41f *9/02*
U.S. Cl. 89—34 11 Claims



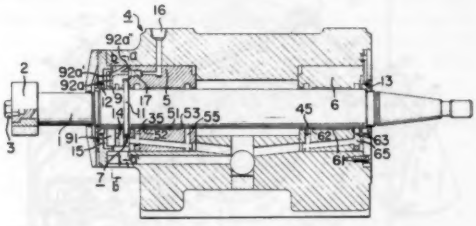
A cartridge storage and feed system includes a magazine having a flat assembly of a plurality of side by side channels, each channel for storing a column of cartridges, and an endless stripping conveyor for cyclically withdrawing the leading cartridge from each of said channels seriatim to provide a train of cartridges for feeding to a weapon.

3,747,470

SPINDLE PROVIDED WITH AN ANTI-VIBRATION MECHANISM

Gentei Inoue; Chuichi Sato, both of Fujisawa, and Mamoru Tanaka, Yokohama, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1971, Ser. No. 170,554
Claims priority, application Japan, Aug. 15, 1970, 45/102406
Int. Cl. B23c *1/00*; F16c *17/16*
U.S. Cl. 90—11 A 8 Claims



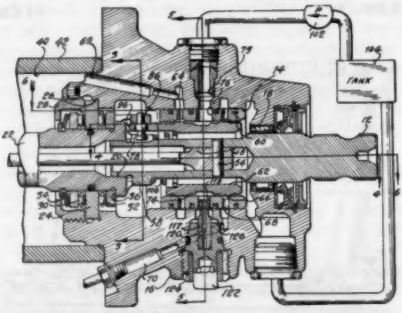
A spindle has its intermediate portion rotatably surrounded by a journal box and journalled in radial bearings provided in the journal box. In the journal box, a thrust bearing for absorbing the thrust load of the spindle is further provided, and the spindle has a flanged portion corresponding to the thrust bearing and inserted therein. A viscous fluid film forming mechanism is provided to attenuate the self-excited vibration which may occur in the spindle during its operation. The viscous fluid film forming mechanism is disposed around the spindle between the bearing portion and the loading point of the spindle, thereby attenuating the vibration of the spindle and ensuring smooth rotation thereof.

3,747,471

POWER STEERING GEAR MECHANISM

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 7, 1971, Ser. No. 178,094
Int. Cl. F15b 9/10
U.S. Cl. 91—382 15 Claims



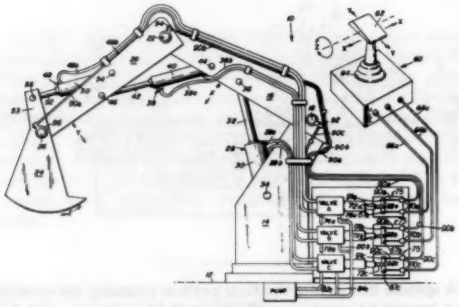
A power steering gear mechanism for use with a wheeled vehicle comprising a torsion rod assembly for transferring steering effort to a driven member of the steering mechanism, a fluid motor for providing a power assist in actuating the driven member and a control valve mechanism for controlling distribution of pressure to the motor including a force transmitting linkage connected to the driven member and adapted for angular adjustment in proportion to the force transmitted therethrough, said linkage being connected to a movable valve element of said valve mechanism for effecting displacement of the latter in proportion to the degree of torque transmitted to the driven member.

3,747,472

FLEXIBLE CABLE HYDRAULIC CONTROL MEANS

Dale A. Knutson, Oconomowoc, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 156,620, June 25, 1971. This application Dec. 17, 1971, Ser. No. 209,247
Int. Cl. F15b 9/16
U.S. Cl. 91—384 11 Claims



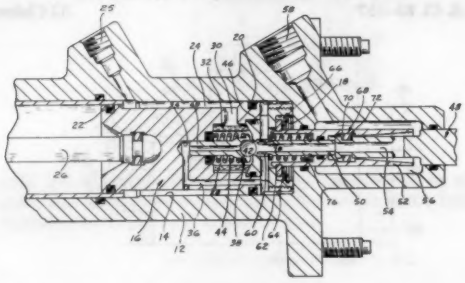
A hydraulic control system for controlling remotely positioned hydraulic cylinders, the system including a number of hydraulically actuated control valves which selectively communicate the hydraulic cylinders to a pressure source, a proportional force amplifier for each of the control valves for selectively opening and closing the control valves, and a feed back assembly to control the amount of movement of the hydraulic cylinders in accordance with the amount of movement of the input lever.

3,747,473

CLOSED CENTER BOOSTER WITH TWO-STAGE HYDRAULIC REACTION

Lloyd G. Bach, and Jerome T. Ewald, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Mar. 18, 1971, Ser. No. 125,655
Int. Cl. F15b 9/10, 15/17
U.S. Cl. 91—373 3 Claims



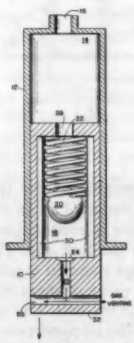
A hydraulic brake booster is disclosed which includes a housing defining a bore therewithin, a boost piston which is slidably mounted in the bore and cooperates with one end of the latter to define a pressure chamber between the piston and the end of the bore, and a valve which controls fluid communication between a pressure source and the pressure chamber. A valve actuation rod is controlled by the vehicle operator and includes an inner member for operating the valve and an outer member which is responsive to the fluid pressure level in the chamber to transmit reaction forces to the vehicle operator, thereby providing brake "feel". The outer member is effective to transmit reaction forces only when the pressure level in the pressure chamber exceeds a predetermined value. Therefore, when the vehicle operator initially applies the brakes of the vehicle, only a very small reaction force will be transmitted through the valve operating rod. However, when the pressure level in the pressure chamber exceeds the predetermined value, a substantially greater portion of the force generated by the fluid pressure in the pressure chamber is transmitted to the vehicle operator.

3,747,474

CONTROLLED ACCELERATION EJECTOR PISTON

Guy F. Cooper, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1971, Ser. No. 173,773
Int. Cl. F15b 11/04, 13/04
U.S. Cl. 91—422 1 Claim



A fluid actuated piston having built in fluid flow control means in the form of a normally closed valve member of sub-

stantial mass. Inertia of the valve mass causes momentary opening of the valve during high accelerations of the piston and a spring closes the valve upon piston deceleration. The effect is to permit some loss of fluid through an exit passage during piston movement and hence to allow variation in the force applied to the piston by changes in spring rate, valve member mass and exit passage dimensions.

3,747,475

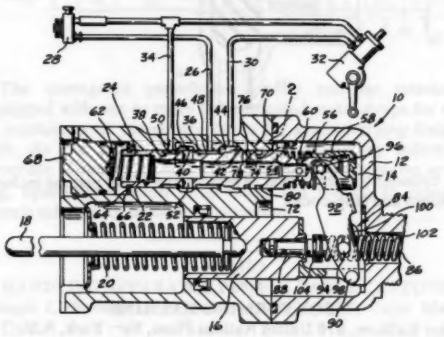
BY-PASS FLOW DIFFUSER

Dean E. Runkle, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed July 12, 1972, Ser. No. 270,917

Int. Cl. F15b *11/08, 13/04*

U.S. Cl. 91—445 **10 Claims**



A hydraulic brake booster is disclosed which includes a housing defining a pressure chamber therewithin in which a boost piston reciprocates and which is also provided with an inlet port connected to the fluid pressure source, an outlet port, and a return or exhuast port communicated to a fluid reservoir. A spool valve is slidably mounted in the housing and is shiftable from a first or brake released position in which the pressure chamber is vented to the reservoir and in which substantially all of the fluid flowing to the inlet is communicated directly to the outlet, to a second position in which fluid flow between the inlet and the outlet is severely restricted and the high pressure fluid at the inlet is communicated into the booster pressure chamber where it acts upon the boost piston to effect a brake application. A by-pass passage is provided between the inlet and outlet port to insure a minimum level of fluid communication between the inlet and outlet even when the spool valve is disposed in the second position. The by-pass passage includes a first flow-restricting orifice which communicates the inlet with a cavity, and a second flow-restricting orifice or diffuser which communicates the cavity to the outlet ports. The two orifices are so designed that the pressure drop across the first orifice is much greater than the pressure drop across the second orifice or diffuser, thereby providing a substantially noiseless valve which may be easily manufactured.

3,747,476

BALANCED HYDRAULIC DEVICE

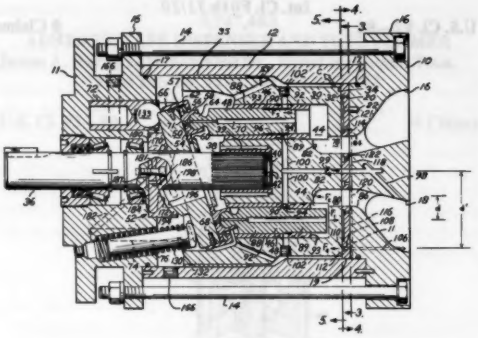
Jay H. Ankeny, West Des Moines; Harold W. Foddy, Woodward, and Dayton F. Kessler, Des Moines, all of Iowa, assignors to Delavan Manufacturing Company, West Des Moines, Iowa

Division of Ser. No. 24,163, March 31, 1970, Pat. No. 3,682,044. This application Apr. 4, 1972, Ser. No. 240,974

Int. Cl. F01b *13/04*

U.S. Cl. 91—489 **19 Claims**

In an axial piston hydraulic device, having an angularly tiltable tilt plate for controlling the stroke of the pistons, the cylinders in the rotor communicate with the high and low pressure ports of the device by way of passages which are positioned between the axes of the cylinders and the rotational axis of the rotor to reduce resistances to fluid flow resulting from rotor rotation when the cylinders are on their low pressure stroke. Additional passages are provided which communicate the high pressure port with the rotor and/or the bearing of the tilt plate to exert counterbalancing forces on these components during operation of the device. On and off-stroke control pistons may also be positioned on the side of the tilt plate opposite the pistons to exert counterbalancing forces on the tilt plate.



3,747,477

VARIABLE VOLUME HYDRAULIC APPARATUS

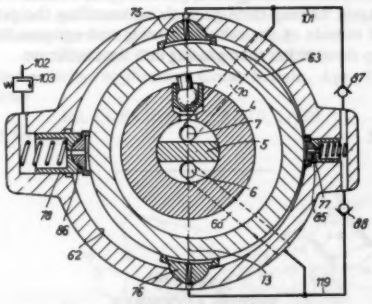
Ulrich Aldinger, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 21, 1970, Ser. No. 39,225

Claims priority, application Germany, May 28, 1969, P 19 27 074.7

Int. Cl. F01b *13/06*

U.S. Cl. 91—497 **5 Claims**



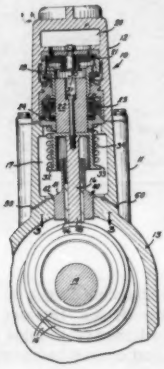
A hydraulic pump or motor of the radial piston type has a control ring for the pistons whose eccentricity to the axis of the rotor determines the transported volume of fluid. Two pistons are diametrically disposed in an axial plane and abut the control ring. The pistons are respectively connected with a source of fluid whose pressure is variable, and with the high pressure side of the hydraulic apparatus so as to vary the eccentricity of the control ring while the same is guided by two supporting means which are diametrically disposed in an axial plane perpendicular to the first-mentioned axial plane.

3,747,478

LIQUID SEALING MEANS FOR A HIGH PRESSURE PUMP

Robert H. Dunn, Bethel, and Robert F. Rasmussen, Minneapolis, both of Minn., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed May 13, 1971, Ser. No. 142,919
Int. Cl. F01b 31/20
U.S. Cl. 92—86 8 Claims



In a high pressure pump having reciprocating pistons each mounted in a cylinder in communication with a crankcase at the lower end thereof, a tubular bearing press fit into an opening communicating the cylinder with the crankcase with the piston stem extending therethrough. The tubular bearing extends coaxial with the piston a substantial distance into the cylinder and an inverted cup-shaped member is affixed to the bottom of the cylinder to extend coaxial with and spaced radially outwardly from the tubular bearing. The parts extend axially a sufficient distance so that the lower end of the cup-shaped member always extends a substantial distance beyond the upper end of the tubular member. A weep slot is formed in the housing in communication with the opening or portion of the cylinder surrounding the upper end of the tubular bearing. Thus, liquid leaking through seals surrounding the piston is retained outside of the tubular bearing and egresses through the weep slots, rather than passing into the crankcase.

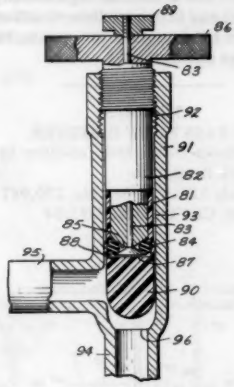
3,747,479

PISTON ASSEMBLY

Douglas Daniel John Nightingale, St. Albans, and Nigel Payne, Knebworth, Hertfordshire, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 97,282, Dec. 11, 1970, which is a continuation-in-part of Ser. No. 31,854, May 1, 1970, abandoned, which is a continuation of Ser. No. 590,236, Oct. 28, 1966. This application Jan. 28, 1972, Ser. No. 221,612
Int. Cl. F16j 9/08; F16k 41/04
U.S. Cl. 92—203 14 Claims

A piston assembly comprises a sheath-like piston member, formed e.g. of PTFE, having a closed end integral with the side wall. Biasing means are located within the member for radially biasing an annular portion of the side wall against a surrounding cylinder to form a seal. Applications of the pistons include syringes and stop-cocks.

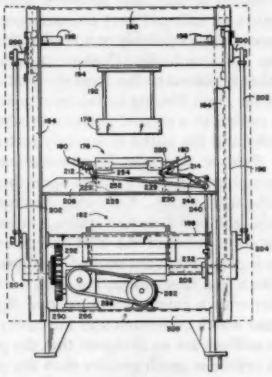


3,747,480

BOX FORMING MACHINE

Peter Kalikow, 870 United Nations Plaza, New York, N.Y.

Filed Sept. 8, 1971, Ser. No. 178,764
Int. Cl. B31b 1/44, 1/46
U.S. Cl. 93—51 R 12 Claims



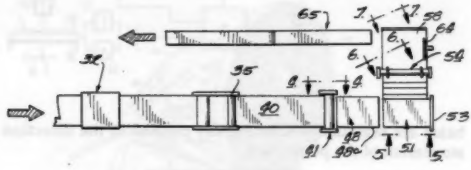
A box forming machine specifically designed to use hot-melt adhesives in the formation of boxes from pre-scored blanks, and to operate at a rate equal to the box-filling demand. Pneumatic means deliver blanks from an overhead stack to a horizontal conveyor. Cam-activated pressure wheels press desired portions only of the blank against continuously revolving adhesive-applicator wheels as the conveyor moves the blanks thereover. The conveyor delivers blanks to the box-forming station, comprising a ram assembly, a box forming die and cam-activated fingers which bend tab portions against side portions as the ram forces the blank through the die. As each box is formed, it pushes the preceding box out of the bottom of the die and onto a delivery conveyor. The adhesive applicator assembly is simple, can not clog or foul, and requires essentially not maintenance.

3,747,481

APPARATUS AND METHOD FOR HANDLING LARGE SIZE CORRUGATED PAPERBOARD PANELS

Henry B. Tonking, Jr., Modesto, Calif., assignor to International Paper Company, New York, N.Y. and The Stanley Works, New Britain, Conn., part interest to each

Filed Dec. 16, 1970, Ser. No. 98,691
Int. Cl. B31b *1/14*; E04c *5/18*
U.S. Cl. 93—1 R 7 Claims



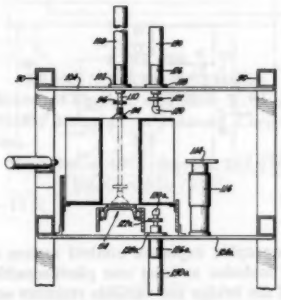
The corrugated paperboard panels can be interiorly equipped with one or more flat elongated metal straps for use as containers or temporary doors for grain-carrying freight cars. As the panels leave the corrugator, they follow a generally U-shaped path involving speed-up, transverse scoring, upsetting adjacent strap ends, and folding to provide panels suitable for immediate shipment.

3,747,482

HANDLING APPARATUS FOR FOLDABLE CARTONS

Joseph C. Berney, 2700 Peterson Way - 22B, Costa Mesa, Calif.

Filed Sept. 8, 1970, Ser. No. 70,566
Int. Cl. B31b *1/80*
U.S. Cl. 93—53 R 6 Claims



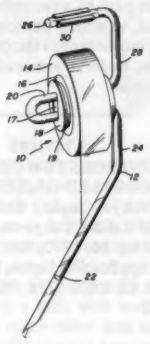
An automatic carton handling apparatus for erecting foldable cartons and positioning them adjacent to a packing machine of the kind which loads the cartons while they are resting on their side panels. The apparatus includes a feed magazine which feeds carton blanks from a stack to a loading station disposed below it, a reciprocating carriage for moving carton blanks from the loading station to a forming station, an opening mechanism for forming the cases into an essentially rectangular tubular configuration, pivotable arms for closing the bottom end flaps, rectilinear arms for closing the bottom side flaps, and a retractable pusher arm associated with the carriage for transferring the opened case from the forming station to a packing station. Included at the forming station is an arm for opening the leading top end flap of the opened carton and a flap flange for maintaining the flap in its opened position. The packing station has associated with it a pivoting carton positioning arm which pushes the opened carton against an end stop, an angular flanged packing horn, carton transfer arms for pushing the opened carton off the carriage onto the packing horn and a lowering arm which contacts the bottom of the carton on the packing horn and lowers the carton after it has been filled, to place the carton in an upright position on a conveyor. The apparatus is synchronized to sequentially feed the cartons in a downstream manner so that the cartons are opened, packed with canned goods, and moved downstream.

3,747,483

ADHESIVE TAPE DISPENSER AND TUBE FORMER

James A. Hurst, 1310 Brockton Dr., Signal Mountain, Tenn.

Filed July 30, 1971, Ser. No. 167,592
Int. Cl. B31c *3/00*
U.S. Cl. 93—80 4 Claims



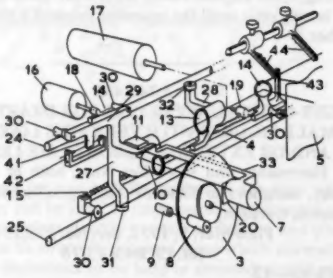
A simple dispensing device is provided for forming from a roll of pressure-sensitive adhesive tape a tube outwardly covered by a pressure-sensitive adhesive. A one-piece member, preferably of rod stock, is bent medially into a U-shaped loop to form a support for a roll of pressure-sensitive adhesive tape. One end of the member is angularly offset to provide a mandrel about which the tape is wrapped into a helix when being formed into a tube. The other end of the stock is bent right angularly and formed with a sharpened cut-off edge for use in cutting the tape when using the device as a conventional dispenser.

3,747,484

PHOTOTYPESETTERS

Haydn Victor Purdy, Down Cottage Down Pl., Windsor, Berkshire, and Ronald Campbell McIntosh, 17 Avenue Rd., St. Albans, Hartfordshire, both of England

Filed Apr. 7, 1970, Ser. No. 26,307
Claims priority, application Great Britain, Apr. 9, 1969, 18,170/69
Int. Cl. B41b *17/12, 21/10, 21/20*
U.S. Cl. 95—4.5 R 3 Claims



A phototypesetting machine employs a continuously rotating character font disc having a plurality of font circles with the character transparencies arranged such that similar

characters have a common base line parallel to a radius of the disc. A high speed flash lamp giving a linear light source, is provided with a diffuser to form an essentially rectangular illuminating beam of light that is uniform across the character field. The light source and diffuser are mounted on one side of the disc and a collimating lens member along with a reflector are mounted on the opposite side of the disc all on the same carriage, to align the light source, lens and reflector with a selected font circle. A pair of spaced bars defining a reference plane and a main light transmission path extend parallel to the plane of the disc, and provide a mount for the input carriage. A second or output carriage also is movable along the bars, spaced to one side of the input carriage, and supporting a further lens and reflector which transmits the shaped light back from the main path to a recording plane, also parallel to the reference plane, at which photosensitive material is supported. A stepping motor moves the output carriage according to character widths, to form a successive lines of text on the photosensitive material.

3,747,485

CAMERA CONTROLS FOR COUPLED AND NON-COUPLED OBJECTIVES

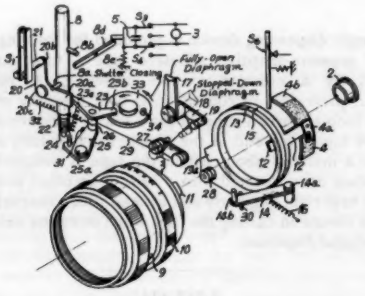
Minoru Suzuki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 16, 1972, Ser. No. 281,024

Claims priority, application Japan, Sept. 9, 1971, 46/69874

Int. Cl. G03b *7/08, 7/20, 13/22*

U.S. Cl. 95—10 CT **7 Claims**



Controls for cameras adpated to use coupled and non-coupled objectives interchangeably. An electrical circuit is provided for utilizing a variable resistor with a coupled objective and direct light measurement through a stopped-down diaphragm with a non-coupled objective, these different operations being determined by a manually operable switch. In the event that a non-coupled objective is mounted on the camera and this latter manually operable switch is not positioned to directly measure light through the stopped-down diaphragm, the exposure time is the equivalent of a bulb exposure, lasting only until the operator releases a shutter-tripping member.

3,747,486

LIGHT-OPTICAL APPARATUS FOR DRAFTING VERY SMALL FIGURES WITH VERY FINE LINE WIDTHS AND/OR EXTREMELY SHORT LINE LENGTHS

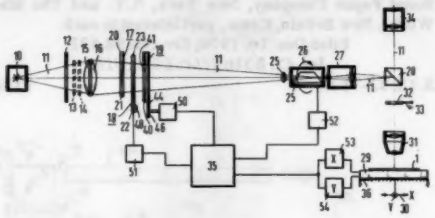
Kurt Herrmann, and Kornelius Noss, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 9, 1972, Ser. No. 233,191

Int. Cl. B43l *13/18*

U.S. Cl. 95—12 **18 Claims**

Apparatus for the optical drafting of very small figures with line widths and lengths of for example, on the order of 1.0 μm or less, by means of an optical light beam projected from a stationary optical system upon a photoplate movable in the plane thereof, to trace lines thereon with said light beam, the latter having a rectangular transverse cross-section and rotatable about the beam axis whereby a pair of parallel edges of the



beam are maintained substantially parallel to the direction of movement of the photoplate.

3,747,487

AN EXPOSURE CONTROL SYSTEM FOR A PHOTOGRAPHIC SYSTEM

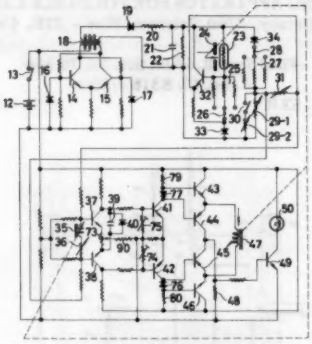
Kinji Tanikoshi, and Tomoshi Takigawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Ota-Ku, Tokyo, Japan

Filed Apr. 10, 1970, Ser. No. 27,282

Claims priority, application Japan, Apr. 17, 1969, 44/35263

Int. Cl. G03b *7/10*

U.S. Cl. 95—10 CD **8 Claims**



In the photographic exposure control system disclosed, a bridge circuit includes at least one photosensitive element. Three arms of the bridge are variable resistors set to respective photographic conditions. The photosensitive element is coupled into the bridge by a transistor amplifier which forms the fourth arm. A differential amplifier circuit is actuated by the out-put of the bridge, and operates an electromagnetic device which adjusts a diaphragm on the basis of the light sensed by the photosensitive element. The operation of the diaphragm is fed back to the bridge either by placing the element behind the diaphragm or by adjusting one of the resistors automatically as the diaphramg changes. The system further includes a damping coil which prevents overshoot of the diaphragm.

3,747,488

PHOTOGRAPHIC MOTION PICTURE APPARATUS

Stewart Bennett, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

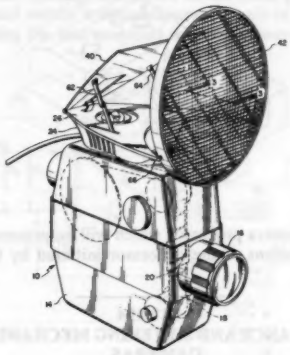
Filed May 20, 1971, Ser. No. 145,267

Int. Cl. G03b *17/56*

U.S. Cl. 95—11 L **12 Claims**

A movie light, adapted for mounting on a motion picture camera, employing a crossed-lenticular lens for providing uniform illumination over a precisely controlled solid angle

conforming to the maximum viewing angle of the camera, for providing efficient illumination of a scene during exposure operations and for providing a source of apparently low brightness to an observer located within the illuminated scene. The lighting unit includes a platform-like base which is adapted to receive an integrally combined high intensity source and dichroic reflector which directs a major portion of the visible radiation in a given direction for transmission through the lens element while laterally dispersing a major



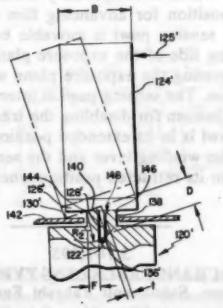
portion of the infrared radiation. An inclined mirror positioned over the source redirects the visible light from its given path to a lens system which consists of a Fresnel lens and a crossed-lenticulated screen. A lug member depending from the lower surface of the base is configured for attachment to the camera for orientation of the lighting unit such that its solid angle of illumination intercepts the viewing angle of the camera within the scene which is to be photographically recorded.

3,747,489

FLASH SOCKET ASSEMBLY

Edison R. Brandt, Cohasset, and Peter F. Costa, Winthrop, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 6, 1971, Ser. No. 205,070
Int. Cl. G03b *19/02*
U.S. Cl. 95—11 R 11 Claims



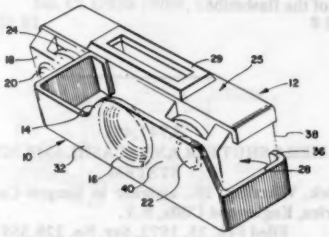
An extremely shallow flash socket assembly for use in or with a photographic camera is constructed to receive a multilamp flash assembly having an array of lamps facing in a common direction and a thin, shallow connector blade adapted to be inserted into the socket assembly. The socket assembly includes novel structures for preventing inadvertent dislodgement of the flash assembly from the socket assembly.

3,747,490

LENS ACCESSORY HOLDER

Edison R. Brandt, Boca Raton, Fla., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1972, Ser. No. 246,917
Int. Cl. G03b *17/56*
U.S. Cl. 95—11 5 Claims



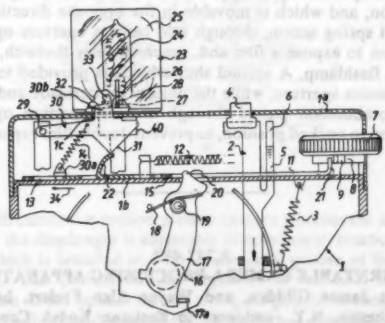
This disclosure explains a concept for a simple accessory holder. The accessory holder, in one embodiment, comprises a wide band having, at each end, a backwardly extending arm with a detent. The accessory holder is made from a springy material so it will snap onto a shutter housing and be held in place by the detents. It comes off by urging the arms apart slightly so the detents come away from the shutter housing. At the center of the band is a hole with means for retaining a filter, a macro lens, and some other lens accessories over an objective lens located in the shutter housing. In one embodiment, the accessory holder and the lens accessory are an integral article.

3,747,491

PHOTOGRAPHIC APPARATUS FOR USE WITH FLASHCUBES OR THE LIKE

Erwin Becker, and Johann Putscher, both of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 29, 1972, Ser. No. 239,060
Claims priority, application Germany, Mar. 31, 1971, P 21 15 736.8
Int. Cl. G03b *15/04*
U.S. Cl. 95—11 L 18 Claims



A still camera for use with flashcubes of the type wherein the flash lamps can be fired in response to transmission of impacts to discrete piezoelectric crystals or the like and wherein the crystals can be struck by stressed wires which normally engage discrete abutments to be held in stressed positions. The camera housing supports a lever which can be pivoted by a slide in response to transport of the film by the length of a frame whereby the lever not only disengages the impeller wire for that flash lamp which faces the subject but also intercepts

the thus disengaged wire to hold it in stressed position. The lever is disengaged from the impeller wire in response to depression of the release element so that the flash lamp which faces the subject is fired simultaneously with opening of the shutter. The lever and the slide are biased by discrete springs, and the slide serves as a means for opening the shutter simultaneously with permitting the lever to assume its normal or retracted position in which the lever does not interfere with indexing of the flashcube.

3,747,492

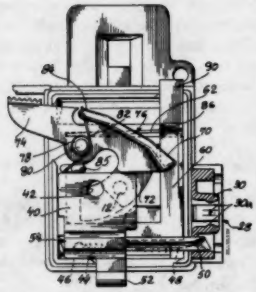
CAMERA SHUTTER AND FLASHLAMP IGNITING SYSTEM

Ib Penick, Wheeling, Ill., assignor to Simpro Corporation of America, Englewood Cliffs, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,355

Int. Cl. G03b *9/70*

U.S. Cl. 95—11.5 R **18 Claims**



A shutter and flashlamp igniting system for cameras adapted for use with percussion-ignitable flashlamps, comprising a unitary spring-biased shutterblade and firing pin combination which is manually movable in one direction through a camera aperture opening position to a cocked, spring-loaded position, and which is movable in the opposite direction, by loaded spring action, through said camera aperture opening position to expose a film and, synchronously therwith, to ignite a flashlamp. A second shutterblade is provided to close the camera aperture, while the unitary shutterblade and firing pin combination passes through camera aperture opening position to cocked position, to prevent double film exposure.

3,747,493

TURNTABLE CAMERA-PROCESSING APPARATUS

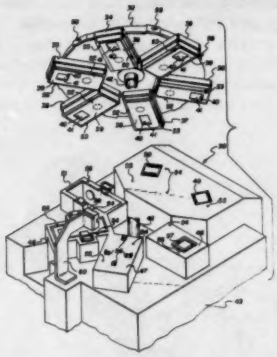
Dennis James Glidden, and Wayne Alan Freiert, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1972, Ser. No. 304,449

Int. Cl. G03b *17/50*

U.S. Cl. 95—14 **3 Claims**

For use in turntable camera-processors or photocopying machines for processing film inserts mounted in apertures of cards, control circuitry is disclosed which is coupled to the turntable and effective to sequentially effect a desired number of exposures of the film inserts and to process a number of such exposed film inserts which is less than the desired number by at least one thereby leaving unprocessed film inserts in the camera processor which will be processed in subsequent operations of the processor initiated by the control circuitry.



3,747,494

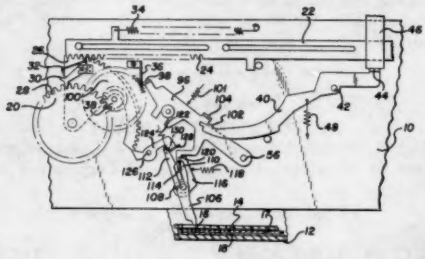
FILM ADVANCE AND METERING MECHANISM FOR CAMERAS

Alexander A. Peters, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1971, Ser. No. 203,732

Int. Cl. G03b *19/04*

U.S. Cl. 95—31 AC **6 Claims**



A camera includes a transport mechanism having a film winding lever which is reciprocally mounted for movement from a rest position for advancing film along an exposure plane. A film sensing pawl is movable between a retracted position on one side of the exposure plane and an extended postion transversing the exposure plane when intercepting a film perforation. The sensing pawl is interconnected with the transport mechanism for disabling the transport means when the sensing pawl is in its extended position. Means interconnecting the film winding lever and the sensing pawl hold the sensing pawl in its retracted position when the lever is in its rest position.

3,747,495

INTERCHANGEABLE LENS TYPE CAMERA

Shobei Tenkumo, Sakai, and Takeshi Egawa, Kainan, both of Japan, assignors to Micro Mega S.A., Besancon, France

Filed Sept. 18, 1970, Ser. No. 73,335

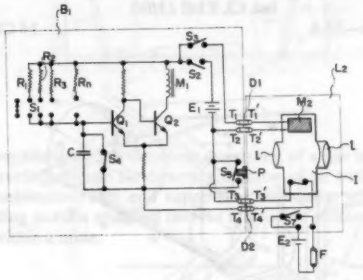
Claims priority, application Japan, Sept. 20, 1969, 44/74346

Int. Cl. G03b *9/62*

U.S. Cl. 95—53 EA **4 Claims**

A camera provided with a circuit for determining the closing of a focal plane shutter in accordance with a desired time

interval includes additional control circuitry for enabling an exposure to be controlled by closure of the lens shutter in an objective lens assembly which is mounted to the camera body. The additional control circuitry includes a normally closed switch shunting a first pair of connector terminals to maintain operation of the control circuitry when the objective lens assembly is not mounted to the camera body. The normally closed switch is open with the objective lens assembly mounted to the camera body and mechanism for closing the lens shutter is energized through a normally open switch closed by the opening movement of the focal plane shutter. An additional switch is shunted across a pair of terminals interconnecting the lens assembly with the camera body and is



closed with the lens shutter open to maintain energization of the focal plane shutter restraining control mechanism. With the objective lens assembly mounted to the camera the apparatus for determining the exposure time interval is set at a time greater than the exposure interval and the mechanism for closing the lens shutter is energized by the closing of the normally open switch and the opening of the additional switch closes the focal plane shutter by de-energizing the control circuit. In another embodiment an additional normally open switch shunting the integrating capacitor in the control circuit is closed with the mounting of said objective lens assembly to the camera body to automatically disable the control circuit enabling exposure to be effected by the lens shutter.

3,747,496

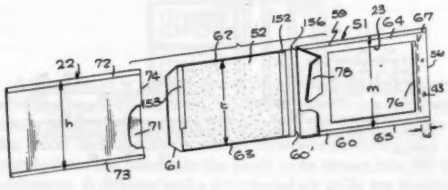
FILM PACKET AND HOLDER

Gerhard I. W. Bahnsen, Box 1297, South Lake Tahoe, Calif.

Filed July 15, 1971, Ser. No. 162,824

Int. Cl. G03b *17/26*

U.S. Cl. 95—72 **5 Claims**



An assembly for holding a film in a camera, and including a holder having front and rear sections between which a film packet is received and retained, with the packet including an outer envelope, a film located in the envelope and adapted to be exposed through a window at one side of the envelope, and a light shield sleeve received within the envelope and about the film and slidably retractable relative to the envelope and film. The two section holder functions when closed to retain the envelope and film against movement with the sleeve when the latter is withdrawn slidably to its retracted position.

3,747,497

CAMERA DRIVE SYSTEM INCLUDING MOTOR DRIVE UNIT AND LONG-FILM MAGAZINE

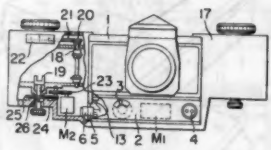
Koichi Daitoku, and Shiro Sugimori, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Chiyoda-ku, Tokyo, Japan

Filed Sept. 15, 1972, Ser. No. 289,455

Claims priority, application Japan, Sept. 20, 1971, 46/85594 (utility model)

Int. Cl. G03b *19/04, 17/36*

U.S. Cl. 95—31 EL **8 Claims**



A camera drive system in which a motor drive unit is adapted for use with a long-film magazine, the magazine having a frame counter switch which assumes control of the motor of the drive unit when the magazine and the drive unit are coupled together. A frame counter switch of the drive unit, which normally controls the motor of the drive unit, is rendered ineffective upon the coupling of the magazine to the drive unit. The long-film magazine has a motor which is controlled by a further switch of the drive unit, so as to advance the film cooperatively with the drive unit motor.

3,747,498

PHOTOGRAPHIC APPARATUS WITH ADJUSTING DEVICE FOR FOCUSSING AND EXPOSURE CONTROL MEANS

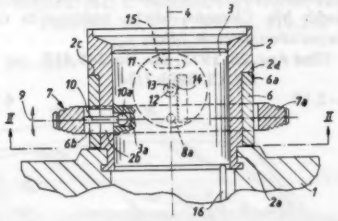
Richard Wick; Alfred Winkler, and Wilhelm Kukuk, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 6, 1971, Ser. No. 187,072

Claims priority, application Germany, Oct. 6, 1970, P 20 49 056.6; Dec. 16, 1970, P 20 61 998.1; Dec. 16, 1970, P 20 62 042.2

Int. Cl. G03b *3/00*

U.S. Cl. 95—45 **14 Claims**



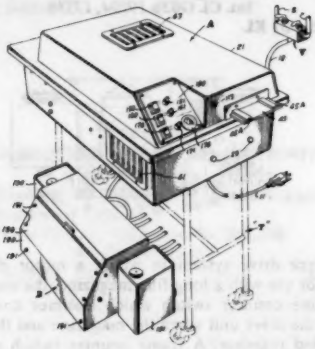
A still camera or motion picture camera wherein the shutter and/or the diaphragm is adjustable in response to rotation of a ring which is installed in a circumferential groove of the lens mount. The picture taking objective is movable in the direction of the optical axis by a ring-shaped, lever-shaped or rotary knob-shaped adjusting device which is mounted on the ring for movement about a second axis which is inclined with reference to the optical axis and intersects or crosses in space with the optical axis. The adjusting device also serves to rotate the ring about the optical axis. The axial position of the objective can be changed independently of or simultaneously with angular movement of the ring, depending upon whether the adjusting device is actuated to merely rotate the ring, to merely move the objective axially or to move the objective axially while rotating the ring about the optical axis.

3,747,499

AUTOMATIC FILM PROCESSING SYSTEM AND APPARATUS FOR X-RAY FILM AND THE LIKE

Michael N. Foster, 1409 Ruth Ave., Arlington, Tex.

Filed July 28, 1970, Ser. No. 58,879
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R 12 Claims



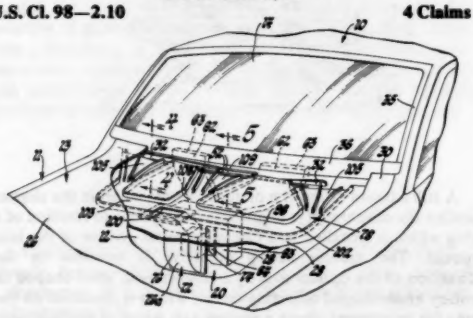
An automatic positive roller transport system X-ray film developing, fixing, washing and drying unit, having film transporting roller systems for moving film through the developer tank, through the fixer tank, and through the wash tank, and then through a dryer, each of which transport systems is separately removable for cleaning or servicing of the transport systems and the tanks. Chemical circulating and supply systems are mounted separately in a separate housing from the developer and fixer tanks so that the chemical fumes are excluded from the pumps and motors used in circulating the chemicals and supplying additional chemicals to the tanks. A blower system vents the tank chamber to reduce corrosive action on the parts therein. The system is designed for continuous dry-to-dry cycle operation, but has stand-by availability, adapted for standard dental film and for larger panoramic type dental film. A daylight loader is also provided.

3,747,500

WINDSHIELD AND WINDSHIELD WIPER DE-ICER

Keith L. Redd, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1972, Ser. No. 248,418
Int. Cl. B60h 1/24
U.S. Cl. 98—2.10 4 Claims



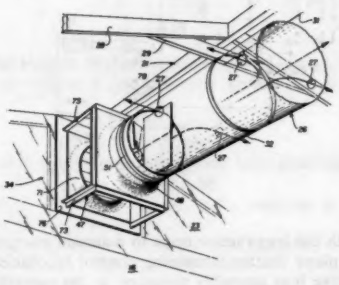
This disclosure relates to a de-icer for the outside of a windshield and windshield wipers of an automotive vehicle having an engine compartment hood movable between open and closed positions. The de-icer comprises a first duct means which is adapted to convey a flow of heated air from a heater means and a second duct means which is formed integrally with the engine compartment hood. The second duct means is adapted to receive and convey the flow of heated air from the first duct means when the hood is in its closed position and to convey the flow of heated air to the windshield. The second duct means has outlet openings for directing the flow of heated air upon the outside of the windshield and the windshield wipers.

3,747,501

SYSTEM AND METHOD FOR CLIMATE CONTROL IN GREENHOUSES

Osamu Honda, 1590 Valota Rd., and Hiroshi Honda, 1576 Valota Rd., both of Redwood City, Calif.

Filed Apr. 19, 1966, Ser. No. 543,742
Int. Cl. F24f 13/00
U.S. Cl. 98—33 A 14 Claims



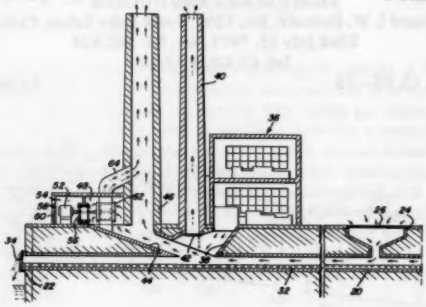
Greenhouse climate control system having a convection tube in alignment with a shutter controlled opening in the greenhouse and having a fan spaced from the opening for introducing air into the convection tube.

3,747,502

AIR POLLUTION CONTROL SYSTEM

John T. Williams, Sr., 329 I St., Rock Springs, Wyo.

Filed June 14, 1971, Ser. No. 152,687
Int. Cl. F24f 7/06
U.S. Cl. 98—43 3 Claims

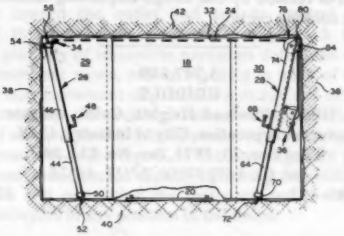


A street level and factory exhaust air handling system utilizing existing underground sewers to draw off street level air and contaminating vehicle exhaust gases as well as gaseous factory waste and functioning to pump the contaminated street level air and gaseous factory wastes upwardly through very tall smokestacks for jet discharging from the upper ends of the smokestacks into upper elevation air for more rapid dispersion and movement to remote areas by the higher velocity air currents which occur at higher altitudes.

3,747,503
MINE VENTILATION CONTROL SYSTEM

Patrick A. Lovell, 245 S. Heber St., Beckley, W. Va.

Filed Mar. 24, 1971, Ser. No. 127,733
Int. Cl. E21f *1/00, 3/00*
U.S. Cl. 98—50 8 Claims

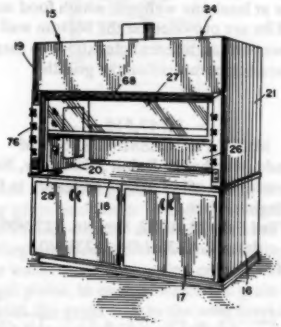


A ventilation control system consisting of a gas impervious air directing curtain for directing the flow of air within a mine in combination with end supporting assemblies with the air directing curtain attached thereto to provide efficient ventilation within a mine.

3,747,504
FUME HOOD

Michael Turko, and Lynn L. Seymour, both of Manitowoc, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 18, 1971, Ser. No. 172,746
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 LH 9 Claims

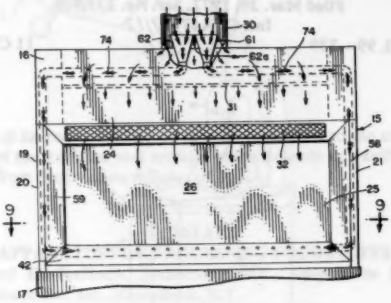


A fume hood is provided with an auxiliary air flow assembly which, when the sash is up, divides the incoming auxiliary air into a portion which flows directly into the work enclosure of the hood and a portion which flows downwardly and outwardly from the hood into the room to be drawn into the work enclosure. A diffuser and a directional air grille are positioned below the auxiliary air inlet between the sash and the front panel of the hood, and a dividing plate extends generally vertically upwardly from the air grille forwardly of the sash. Auxiliary air flows generally vertically downwardly through the diffuser toward the air grille. The divider plate directs a portion of this downwardly flowing air between the divider plate and the sash where it is drawn into the work enclosure, and the remainder of the auxiliary air flows through the air grille. The air grille includes directional vanes which directs the air outwardly and downwardly from the upper portion of the work opening to be drawn into the work enclosure across the work surface.

3,747,505
AIR FLOW SYSTEM FOR FUME HOOD

Michael Turko, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 172,746, Aug. 18, 1971. This application Feb. 18, 1972, Ser. No. 227,510
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 LH 13 Claims

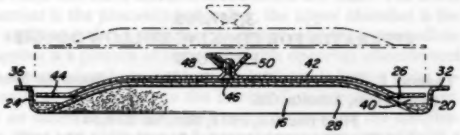


A balanced air fume hood is provided with an air flow system for inwardly directing high velocity auxiliary air over the top of the work surface and/or along the sides of the hood. An elongated air flow conduit is secured below the foil of the fume hood adjacent the front of the work surface, and an elongated tube extends from each end of the conduit to the auxiliary air chamber which supplies auxiliary air to the work enclosure. The ends of the tubes are provided with funnel-shaped air collectors which are positioned in the path of the incoming auxiliary air, and high velocity auxiliary air flows through the tubes to the conduit. The conduit is provided with a plurality of openings for permitting auxiliary air to flow between the foil and the work surface and over the top of the work surface. The vertically extending portions of the tube may be provided with openings for directing high velocity auxiliary air inwardly toward the work enclosure to provide a positive inwardly sweeping curtain of air along the sides of the hood.

3,747,506
OVEN BROILER COOKING UTENSIL

Truly M. Belgard, 5645 E. Belknap, Fort Worth, Tex.

Filed Dec. 30, 1971, Ser. No. 214,236
Int. Cl. A47j *37/10*
U.S. Cl. 99—349 9 Claims



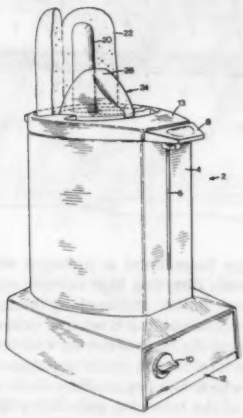
A container for broiling relatively flat pieces of meat in an oven. The container includes an upwardly convexed convex-concavo bottom wall and upstanding peripheral walls projecting upwardly from and extending about the periphery of the bottom wall. A cover is provided for the container and includes an upwardly convexed convex-concavo central portion bounded by a generally horizontal outer portion. The cover is receivable downwardly within the confines of the peripheral walls of the container and its concavo-convex portion is shaped to conform to and closely overlie the concavo-convex portion of the bottom wall of the container in surface-to-surface engagement therewith while the generally horizontal outer peripheral portion of the cover overlies, in vertically spaced relation thereto, a peripheral grease sump defined

between the outer peripheral portions of the bottom wall and the upright peripheral walls of the container within the latter.

3,747,507
TOASTER FOR FRANKFURTER AND FRANKFURTER BUN

Lawrie G. McIntosh, Etobicoke, Ontario, Canada, assignor to Russell Holdings Limited, Toronto, Ontario, Canada

Filed Mar. 20, 1972, Ser. No. 235,926
Int. Cl. A47j *27/12*
U.S. Cl. 99—339 11 Claims

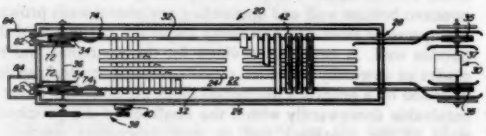


A toaster for frankfurters and buns, having a circular frankfurter heating chamber formed by two apertured reflective removable shields. The shields have inturned ends forming two spaced cylindrical frankfurter guides. Two arcuate bun heating chambers partly encircle the frankfurter heating chamber, with a frankfurter guide between the arms of each bun heating chamber. A common elevator raises and lowers both frankfurters and buns simultaneously. Part of the heat from an element in the frankfurter heating chamber passes through apertures in the shields to toast buns in the bun heating chambers, and the remainder is reflected back to augment the heat applied to the frankfurters, so the frankfurters and buns will be finished together. Since each bun is toasted in partly opened configuration, it will not split in two, and since it pops-up partly encircling its frankfurter, it can be used to grasp and remove the frankfurter.

3,747,508
APPARATUS FOR COOKING HOLLOW DOUGH PRODUCT

Thomas E. Elam, Sr., Clarksville, Tenn., assignor to Merrill Lynn Elam, Atlanta, Ga.

Filed Dec. 21, 1971, Ser. No. 210,347
Int. Cl. A21c *11/00, 15/00;* A21d *13/08;* A23p *1/00*
U.S. Cl. 99—354 16 Claims

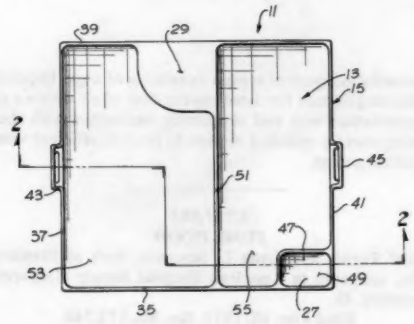


A cooking apparatus is provided which bakes hollow dough products in a continuous cycle. A dough dispensing mechanism automatically fills conveyor mounted cooking molds prior to entering the oven. A molding rod extends horizontally into the interior of each mold and remains there during the baking process. After the baking is completed, each molding rod is automatically pivoted away from the interior of its mold with the dough product remaining thereon. As the conveyor continues to advance, the dough product is automatically pulled from each molding rod. Each molding rod is returned to its original horizontal position in each mold, and each mold is refilled by the dough dispensing mechanism to repeat the cooking cycle.

3,747,509
GRIDDLE

Joseph D. Hinkle, Rowland Heights, Calif., assignor to Dam Fine Products Corporation, City of Industry, Calif.

Filed Dec. 23, 1971, Ser. No. 211,395
Int. Cl. A47j *37/10, 27/12, 36/24*
U.S. Cl. 99—422 12 Claims

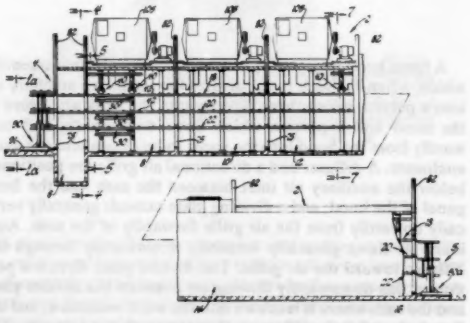


A griddle including a bottom wall adapted to be placed on a heat source and a peripheral wall joined to the bottom wall and circumscribing at least a region of the bottom wall to thereby define at least one well into which food may be placed for cooking. Ribs are provided on the bottom wall and the bottom wall has sections at different elevations to thereby provide different surface temperatures on the griddle.

3,747,510
MEAT PROCESSING SYSTEM

Andrew J. Gladd, Northville; Ralph J. MacKay, Novi, and Paul Gancia, Farmington, all of Mich., assignors to Gladd Industries, Farmington, Mich.

Filed Feb. 22, 1972, Ser. No. 227,909
Int. Cl. A23b *1/04;* A23l *3/02*
U.S. Cl. 99—443 C 34 Claims



Meat processing apparatus including an elongate enclosure having an inlet end and outlet end with a plurality of treatment zones defined therein. A plurality of walking beam conveyors

are mounted in the enclosure and extend from the inlet to the outlet end and are movable between a retracted position in the direction of the inlet and an extended position in the direction of the outlet. Lifting means are located in each treatment zone for lifting meat and similar products from the conveyors prior to a retraction movement of the conveyors, and to subsequently return the products onto the conveyor prior to an extension movement of the conveyors to cause the products to advance toward the outlet end and to control the time required to advance the products through each treatment zone. A plurality of transverse partitions define the end walls of the treatment zones, and an opening in each of the partitions permits movement of products into and out of the treatment zones by the walking beam conveyors. A door is mounted on each partition for movement between opened and closed positions with respect to the opening. The partitions are formed with slots for slidably receiving the walking beam conveyors and permitting the reciprocation of the walking beam conveyors in any position of the doors.

3,747,511

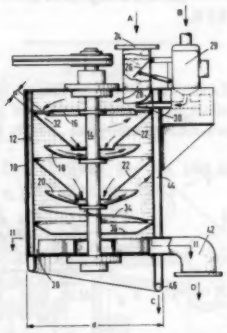
DEVICE FOR HUMIDIFYING CORN

Leslie Palyi, 23 Larabee Cres., Don Mills, Ontario, Canada

Filed July 16, 1971, Ser. No. 163,371

Int. Cl. B01f 7/16

U.S. Cl. 99—516 **9 Claims**



A device for moistening grain or the like, including a disc for receiving grain and water at high pressure; a centrifugal plate, which rotates rapidly disposed beneath the receiving disc and having a perforated screen surrounding the rotor so as to remove water while entrapping grain; a vertical series of the centrifugal plates, in each of which the grain is centrifuged and from which the grain falls to the next level beneath, until the grain is finally removed from the device.

3,747,512

BACON DERINDING MACHINE

Hermann Schill, deceased, late of Schulstrasse 14, 7601 Goldscheuer, Germany (by Hermann Schill, Jr., administrator)

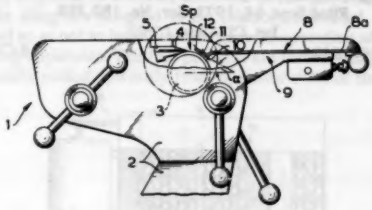
Filed Feb. 16, 1972, Ser. No. 226,683

Claims priority, application Germany, Feb. 16, 1971, P 21 07 236.6

Int. Cl. A22c 17/12

U.S. Cl. 99—589 **8 Claims**

A bacon derinding machine comprises a knife which is preferably adjustable to different derinding thicknesses and to total derinding of a material to be derinded; a traction roller for conveying the material up to said knife, the arrangement being such that a gap is left between the cutting edge of the knife and the traction roller, and a feed table having a supporting surface which is generally on a level somewhat lower than that of the gap between said cutting edge and said traction roller, the supporting surface of the feed table having within



range of its end extending up to a position close to the cutting edge of the knife an end section which extends upwardly and away from the traction roller.

3,747,513

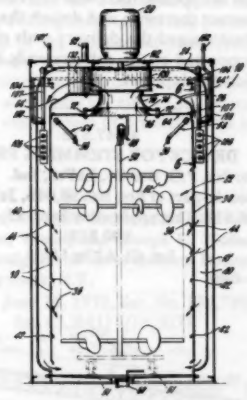
APPARATUS FOR PROCESSING FOODSTUFFS

Bernard H. Seelbach, Staatsburg, N.Y., assignor to K. C. Seelback Co., Inc., Rhinebeck, N.Y.

Filed Mar. 3, 1972, Ser. No. 231,566

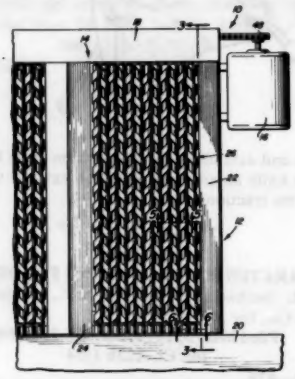
Int. Cl. A23b 3/04

U.S. Cl. 99—476 **35 Claims**



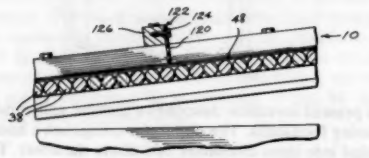
The present invention describes a method and apparatus for processing foodstuffs. The apparatus comprises a housing that is divided into three chambers, one above the other. The lower chamber is the processing chamber, the upper chamber is the air and/or smoke distribution chamber, and the intermediate chamber is a plenum chamber. Suitable openings interconnect the several chambers, and an air inlet extends from a point externally of the housing to the intermediate plenum chamber. An air outlet and heating means are disposed in the distribution chamber, while means for supplying smoke extend from a point externally of the housing to the processing chamber. A blower is mounted in the distribution chamber and is driven in such manner as to withdraw air and/or smoke from the processing chamber and air from the plenum chamber to the distribution chamber for eventual recycling to the processing chamber, or to the air outlet. The opening interconnecting the plenum chamber and the processing chamber is provided with a variable slot arrangement including an inverted volute and a hollow truncated cone, with the combination of said volute and truncated cone being effective to ensure a uniform distribution of air and/or smoke within the processing chamber. The uniform distribution of flow within the processing chamber is required to ensure the uniform cooking and/or smoking of all of the foodstuff products disposed in the processing chamber.

3,747,514
FRUIT STEMMER
Frederick P. Ireland, Stayton, Oreg., assignor to Stayton Canning Company Cooperative, Stayton, Oreg.
Filed Sept. 14, 1971, Ser. No. 180,388
Int. Cl. A23n *15/02*
U.S. Cl. 99—640 8 Claims



Intermeshing, helical formations on a plurality of parallel rollers, driven in opposite rotational directions, grip the stems of fruit in contact therewith and detach the stems while conveying the fruit toward the delivery ends of the rollers. The rollers are supported at the delivery ends by space bearings between which debris passes.

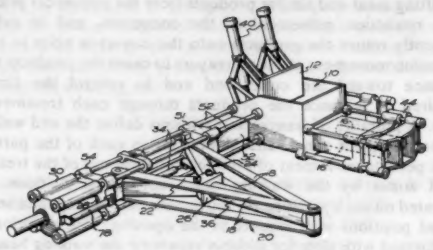
3,747,515
DEVICE FOR STEMMING FRUIT
Emil Elias Pertics, P.O. Box 84, LaPaz, Ind.
Continuation-in-part of Ser. No. 58,068, July 24, 1970, Pat. No. 3,680,618. This application Sept. 15, 1971, Ser. No. 180,818
Int. Cl. A23n *15/02*
U.S. Cl. 99—640 2 Claims



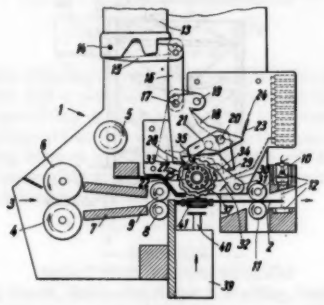
A device for removing stems from fruit including an endless power driven belt consisting of a plurality of traverse parallel rollers and having upper and lower frame supported runs. Each roller along the upper run of the belt is caused to rotate in a direction opposite to the direction of rotation of the immediate roller on each side thereof. The fruit is deposited upon the upper run of the belt and as it advances along such run, the stems thereof are received between adjacent rollers and pulled from the fruit.

3,747,516
METHOD OF BALING TOWN OR URBAN REFUSE
Erik Wood, Pontefract, England, assignor to Refuse Compaction Ltd., Bedfordshire, England
Filed Apr. 22, 1971, Ser. No. 136,604
Claims priority, application Great Britain, Apr. 22, 1970, 19,156/70
Int. Cl. B30b *15/34*
U.S. Cl. 100—38 2 Claims

In forming batches of town refuse into bales in order to prevent the formation of compressed air pockets within the bale which would tend to cause the bale to increase in dimension or perhaps disintegrate, the batch of material while in the bale chamber is treated with steam so that this steam at least partially fills the pockets an upon cooling forms partial vacuums in the pockets, whereby the inherent compressive forces of compressed air pockets are avoided.



3,747,517
TYPE WHEEL SETTING AND LOCKING MEANS AND PRINT ACTUATING MEANS IN SELECTIVE PRINTERS
Edward Robaczek, Obershausen, Germany, assignor to Maks Apparatebau Fritze Brede Offenbach/Main, Frankfurt, Germany
Filed May 6, 1971, Ser. No. 140,866
Int. Cl. B41j *7/50, 9/00*
U.S. Cl. 101—93 R 10 Claims

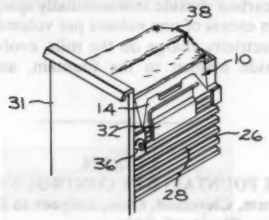


A printer for printing and issuing tickets has a stereotype roller comprising individual stereotype wheels each connected to a ratchet wheel and each having grooves formed in its periphery. A lever system actuable by a solenoid carries pawls, some of which are operable to rotate individual stereotype wheels in a stepwise manner and some of which are operable to hold the individual stereotype wheels against rotation in either direction. An electrical monitoring circuit de-energizes the solenoid when the stereotype wheels are in preselected printing positions and actuates the printing. To insure that the blank to be printed has reached the printing position, a circuit actuated by the interruption of a light beam in the path of the blank may be added to start the printing process.

3,747,518
TRASH COMPACTOR HAVING MEANS FACILITATING TRASH REMOVAL THEREFROM
Edward L. Macolcz, Glendale, Wis., assignor to General Electric Company, Louisville, Ky.
Filed Nov. 16, 1971, Ser. No. 199,267
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 13 Claims

Refuse storage apparatus such as a compacting appliance of the type having a driven ram for compacting collected refuse in a bin is provided with an elongated band for use as a sling in

manually removing the compacted trash from the bin. The sling is specifically designed to conform to the inside of the bin and is disposed to underlay the trash in the bin. Flap portions of the sling are adapted to be foldably retracted and positioned so as not to interfere with general operation of the compacting apparatus. The flap portions are further adapted to be manually pulled upwardly from opposite sides of the bin and brought together whereby the sling, with the compacted trash



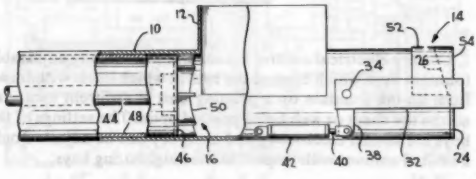
enwrapped therein, may be withdrawn from the bin by the operator exerting a lifting force on the flap portions. The sling facilitates removal of the compacted trash from the bin and enables the operator to conveniently carry the compacted trash from the compacting apparatus for final disposal with less likelihood of accidental staining to the operator's clothes or abrasion from sharp edges of crushed items in the load of trash.

3,747,519

TRASH-COMPACTING APPARATUS

William T. Capps, Sr., Bladensburg, and Robert J. Hunnam, Carrollton, both of Md., assignors to Ram-Pack, Inc., Hyattsville, Md.

Filed Oct. 19, 1971, Ser. No. 190,484
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 **7 Claims**



Apparatus for compacting trash of the type including an elongated hollow cylinder having an open discharge end, a compacting piston longitudinally reciprocable in the cylinder, and a pivotable closure for the discharge end of the cylinder. The discharge end of the cylinder has a rearwardly inclined peripheral cut-out portion, a closure having a rearwardly inclined peripheral flange complementary to and mating with such cut-out portion when the closure is in its closed position. The piston preferably includes on its forward pressure surface a plurality of rearwardly inclined radial ribs defining a discontinuous concave trash-engaging surface.

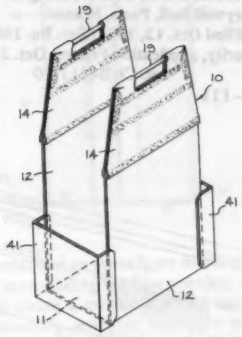
3,747,520

TRASH COMPACTOR HAVING MEANS FACILITATING TRASH REMOVAL THEREFROM

Leonard J. Martinink, Waukesha, Wis., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 16, 1971, Ser. No. 199,284
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 **13 Claims**

Refuse storage apparatus such as a compacting appliance of the type having a driven ram for compacting collected refuse in a bin is provided with an elongated band for use as a sling in manually removing the compacted trash from the bin. The sling is specifically designed to conform to the inside of the bin and is disposed to underlay the trash in the bin. Flap portions of the sling are adapted to be foldably retracted and positioned so as not to interfere with general operation of the compacting apparatus. The flap portions are further adapted to be manually pulled upwardly from opposite sides of the bin and



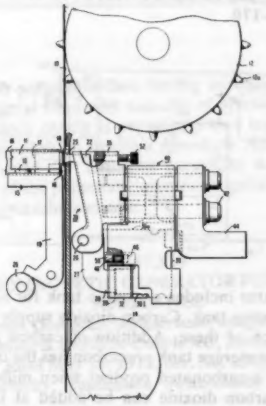
brought together whereby the sling, with the compacted trash enwrapped therein, may be withdrawn from the bin by the operator exerting a lifting force on the flap portions. The sling facilitates removal of the compacted trash from the bin and enables the operator to conveniently carry the compacted trash from the compacting apparatus for final disposal with less likelihood of accidental staining to the operator's clothes or abrasion from sharp edges of crushed items in the load of trash.

3,747,521

LOW COST HAMMER UNIT

John G. Hamilton, Vestal, and Joseph E. Wallace, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 25, 1971, Ser. No. 156,780
Int. Cl. B41j *9/10, 9/38*
U.S. Cl. 101—93 C **8 Claims**



A low cost print hammer unit comprises an assembly of electromagnet cores molded in a plastic body. A plurality of print hammers are pivotally supported in a non-magnetic member secured to the plastic body. The print hammers comprise unitary structures each having a hooked armature por-

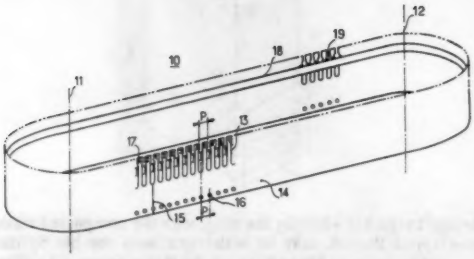
tion at one end and an angularly disposed extension with a hammer face at the other end for impacting a document for printing thereon.

3,747,522

ENDLESS TYPE CARRIER WITH TYPE FINGERS CONNECTED BY AN ENDLESS STRIP AND INTERPOSED VISCOUS DAMPING BLOCKS

Christian Torrens, Paris, France, assignor to Societe Industrielle Honeywell Bull, Paris, France

Filed Oct. 12, 1971, Ser. No. 188,057
Claims priority, application France, Oct. 20, 1970, 7037768
Int. Cl. B41j *1/20*
U.S. Cl. 101—111 **9 Claims**



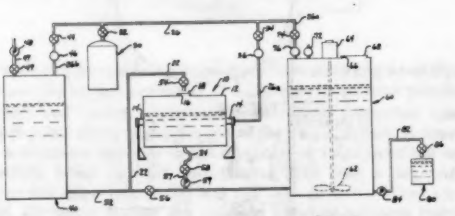
For employment in an on-the-fly printer wherein printing is accomplished by selectively actuating print hammers aligned along a print line to drive a print-receiving member against opposed moving type elements, a type-supporting member wherein type elements are mounted on individual resilient tongues of a moving endless belt to travel along the print line and wherein damping means is provided to suppress vibration of the type-carrying tongues in the plane of the print line.

3,747,523

METHOD OF PRINTING WITH CARBONATED INK

David D. Pipkins, Downers Grove, Ill., assignor to The Valspar Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 80,833, Oct. 15, 1970, Pat. No. 3,705,044. This application June 18, 1971, Ser. No. 154,411
Int. Cl. C09d *11/00*; B41m *1/10*
U.S. Cl. 101—170 **5 Claims**



The apparatus includes a storage tank for solvents, a ball mill, and a tinting tank. Carbon dioxide supply lines are connected to each of these. Addition of carbon dioxide under pressure to the storage tank precarbonates the organic solvent and provides a carbonated product when milled with a pigment. The carbon dioxide can be added at the mill either alone, or in combination with precarbonation. Solvents or diluents are added in the tinting tank and the resulting product is a carbonated paint or ink which has improved anti-skinning characteristics. The storage tank arrangement reduces emissions of organic solvents into the atmosphere. The use of carbon dioxide reduces flammability in the system, of the product, and during subsequent use. Improved conductivity of the carbonated solvent also results.

A container has a carbonated paint or ink therein and the carbon dioxide is interstitially spaced in an amount sufficient to evolve into the head space of the container to provide a protective atmosphere.

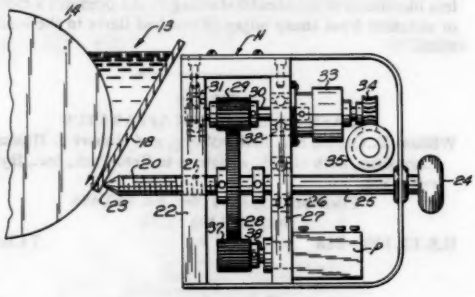
The printing method includes placing carbonated ink in a gravure press fountain, and supplying the carbonated ink to the gravure roll which applies it with direct pressure to the paper. The carbon dioxide is interstitially spaced in the ink in an amount in excess of one volume per volume which reduces the static electricity charge on the rolls, evolves a protective carbon dioxide blanket in the fountain, and reduces fire hazard.

3,747,524

INK FOUNTAIN KEY CONTROL SYSTEM

James N. Crum, Cleveland, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Continuation of Ser. No. 829,916, June 3, 1969, abandoned. This application Sept. 21, 1971, Ser. No. 182,538
Int. Cl. B41f *31/04*
U.S. Cl. 101—365 **14 Claims**



Unitary electrical control for several individually adjustable fountain keys which control the rate at which ink is withdrawn from an ink fountain on a printing unit at different locations across the sheet or web being printed upon. The settings of the keys are sensed electrically and each key can be adjusted only a limited amount with respect to the neighboring keys.

3,747,525

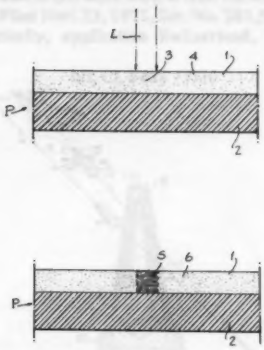
TREATING A DEVELOPED GELATIN SILVER HALIDE EMULSION LAYER ELEMENT WITH ACETIC ACID AND DISCHROMATE IONS

Vere Maffet, Wading River, and Armin C. Remeat, Shoreham, both of N.Y., assignors to AGFA-Gevaert N.V., Mortsel, Antwerp, Belgium

Continuation of Ser. No. 666,277, Sept. 8, 1967, abandoned. This application June 3, 1971, Ser. No. 149,785
Int. Cl. G03f *7/02*; B41m *1/00*
U.S. Cl. 101—450 **4 Claims**

This invention relates to the production of a positive-printing lithographic printing plate. The process utilizes an improved stop-bath solution which may be used with a wide variety of emulsions and developer solutions. One of the outstanding features of the invention is that exposure of the plate element to a positive original results in development of the plate element as a photographic negative image which will enable a press to print a positive copy. This is accomplished by treating the photographically developed plate in a stop-bath

containing an oxidizing agent, such as potassium dichromate, which is capable of reacting with unoxidized developing agent,



such as hydroquinone, in the non-image areas of the plate to make these areas oleophilic through a mechanism akin to polymerization or tanning.

3,747,526

LANDMINE WITH PRESSURE TRIGGER

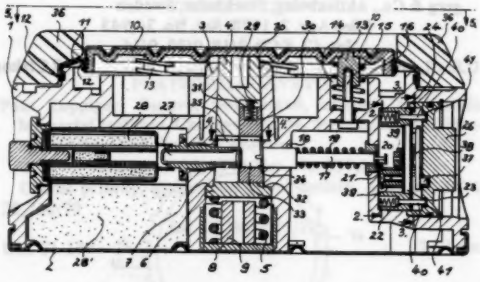
Johann Jany, Volkringhausen ub. Frondenberg-(Ruhr), Germany, assignor to Baufa-Werke Richard Rinker, Menden, Germany

Filed Aug. 26, 1971, Ser. No. 175,205

Claims priority, application Germany, Oct. 9, 1970, P 20 49 656.4

Int. Cl. F42b *23/00*

U.S. Cl. 102—8 **11 Claims**



A landmine having a plunger operative, when moved, to release a firing pin to thereby set off an explosive charge. The firing pin is held by a flyweight that is yieldably mounted to the plunger so that when the plunger is momentarily moved at a relatively rapid speed the inertial resistance to movement of the flyweight will inhibit the movement of the flyweight, thereby preventing the relaease of the firing pin.

3,747,527

PROCESS AND PRODUCT

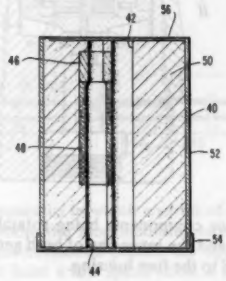
George L. Griffith, Coopersburgh, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed July 7, 1971, Ser. No. 160,435

Int. Cl. F42b *1/04*

U.S. Cl. 102—24 R **9 Claims**

A booster for initiating relatively insensitive explosive compositions, and a process for manufacturing such boosters. In accordance with the process, a base is provided with at least one upstanding rod in the location at which an opening is desired in the booster for a fuse. A layer of relatively sensitive explosive material is placed around this rod, and an outer form having the cross-section desired of the finished booster is placed around the rod and explosive layer. A somewhat insensitive explosive material of high brisance is placed within the outer form and surrounding the relatively sensitive explosive material and allowed to harden to form the finished booster which thus comprises an outer layer of the somewhat insensitive explosive material and an inner layer of the more sensitive explosive material surrounding the fuse opening. A second rod can be provided to cause a second opening into the booster also contacting relatively sensitive explosive material. This second opening, for example, might accommodate a detonating cap. The layer of relatively sensitive explosive material can be provided in two or more lengths, if desired.



3,747,528

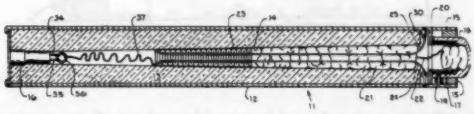
AIRCRAFT PARACHUTE FLARE HAVING TAPERED CORE CANDLE

Benjamin F. Harkness; Billy J. Humerickhouse, both of Odon; Norbert E. Matheis, Jasper, and Alfred W. Norris, both of Bloomington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1972, Ser. No. 229,609

Int. Cl. F42b *13/38*

U.S. Cl. 102—35 **4 Claims**



An aircraft parachute flare having an outer case of consumable material filled with a candle of pyrotechnic material. The pyrotechnic candle is provided with a tapered core that provides a chamber for storing a parachute. An environmental fuze is provided for initiating parachute deployment and deployment of the parachute initiates an igniter which, in turn ignites the pyrotechnic candle.

3,747,529

ELECTROMAGNETIC GENERATOR FOR A RIFLED PROJECTILE

Pierre Plattner, Oberglatt, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed May 25, 1972, Ser. No. 256,815

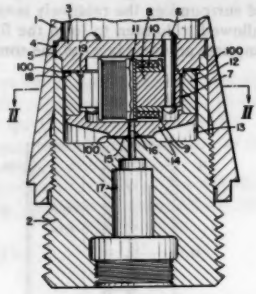
Claims priority, application Switzerland, June 3, 1971, 8110/71

Int. Cl. F42c *11/04*

U.S. Cl. 102—70.2 GA **3 Claims**

An electromagnetic generator for a rifled projectile comprising an armature coil and a field magnet defining a pair of generator components. There is also provided a fuse housing

in which both generator components are arranged within one another and rotatable relative to one another, the outer one of



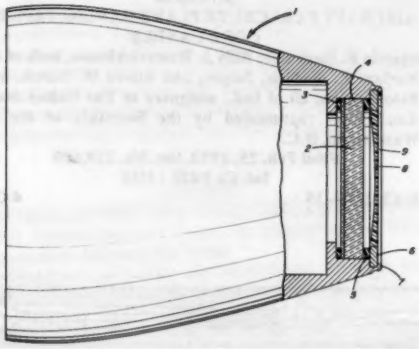
both generator components being rotatably mounted in the fuse housing and the inner one of both generator components being secured to the fuse housing.

3,747,530

WINDOW PROTECTOR

Charles W. Tepper, Rochester, N.Y., assignor to the United States of America as represented by the Secretary of the Navy

Filed Oct. 26, 1966, Ser. No. 590,149
Int. Cl. F42c *13/02, 19/00, 19/04*
U.S. Cl. 102—70.2 P 5 Claims



A protector for an optical fuze window formed of a thin polyester film spatially displaced in front of the window and having a thin film of meltable wax deposited thereon.

3,747,531

OVERRIDING IMPACT PROXIMITY FUZE

Robert M. Powell, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1958, Ser. No. 713,274
Int. Cl. F42c *13/00, 11/00, 15/40*
U.S. Cl. 102—70.2 P 5 Claims

1. A fuze for effecting destruction of a target by igniting an explosive vehicle comprising means for radiating an electromagnet wave and for intercepting a target reflected portion thereof, first circuit means for generating said electromagnetic wave and for developing an output signal having a frequency correlative to the frequency difference between the radiated and reflected waves, said first circuit means being responsive to said radiating and intercepting means, second circuit means connected to said first circuit means to produce a variable potential signal indicative of the frequency of said output signal, electrostatically actuated means coupled to said second circuit means for selectively rendering said second circuit means non-responsive to said output signal, and means for alternatively effecting ignition of the explosive vehicle by said

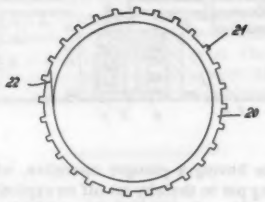
potential signal or by target impact of the explosive vehicle, said last named means being responsive to said second circuit means.

3,747,532

PROCESS FOR THE MANUFACTURE OF COMBUSTIBLE CASES FOR FUEL CHARGES OR EXPLOSIVE CHARGES

Curt Berger, Sackingen, Germany, assignor to Henry Wallenberg & Co., Aktienbolag, Stockholm, Sweden

Filed Apr. 2, 1970, Ser. No. 24,943
Int. Cl. F42b *9/18, 9/30, 9/16*
U.S. Cl. 102—97 8 Claims



The manufacture of cases for fuel charges or explosive charges such as cartridges, shells, tubes for rockets and cases for mines of combustible materials such as nitrated cellulose comprises nitrating layers of reinforced nonwoven fabrics in a known manner, combining the nitrated layers one upon another, drying the laminate thus obtained, preparing sections in the form of developments of the shape of the cases from said laminate, partially dissolving or softening respectively and shaping the sections into said cases. The cases may be coated for storing with a protective layer of swellable natural or synthetic polymeric material which in turn may be provided with a hydrophobic insulating coating. Preferably the laminate is prepared in a way that the nitrogen content of the nitrated nonwoven fabric layers increases from the outer periphery to the interior of the cases.

3,747,533

SHORT TRAJECTORY MISSILE

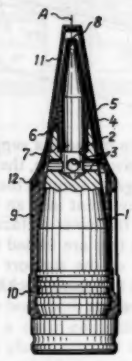
Rudolf Rossmann, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Nov. 23, 1971, Ser. No. 201,521

Claims priority, application Switzerland, Dec. 8, 1970, 18326/70

Int. Cl. F42b *13/20*

U.S. Cl. 102—92.7 5 Claims



Short trajectory missile comprising a missile body and a missile head separating during flight. A part of the missile head such as the front end thereof is formed of a material capable of melting due to the friction of air resistance.

3,747,534

PLATFORM CONVEYORS

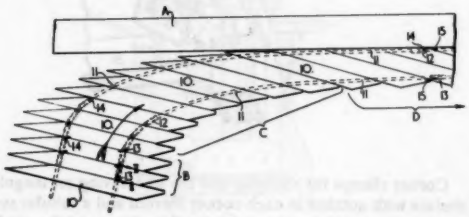
Paul Zuppiger, Geneve, Switzerland, assignor to Battelle Memorial Institute, Carouge/Geneve, Switzerland and Dunlop Holdings Ltd., London, England

Filed Apr. 26, 1971, Ser. No. 137,243

Claims priority, application Great Britain, Apr. 29, 1970, 20,730/70

Int. Cl. B65g *15/22*

U.S. Cl. 104—25 7 Claims



A platform conveyor having a high speed section, an intermediate variable speed section and a low speed section in which the platforms slide laterally relative to each other in the variable speed section wherein at least two carriages support each platform and guide rails and pivotal connections are provided between each carriage and the platforms.

3,747,535

TRANSPORTING APPARATUS

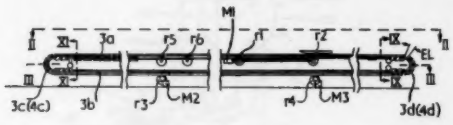
Paul Zuppiger, Geneve, Switzerland, assignor to Dunlop Holdings Limited, London, England

Filed July 16, 1971, Ser. No. 163,217

Claims priority, application Switzerland, July 17, 1970, 10911/70

Int. Cl. B65g *23/32*

U.S. Cl. 104—25 17 Claims



A transporting apparatus in which a series of platforms are driven in a closed-loop, the loop including two similar main segments in adjacent horizontal planes, the upper main segment comprising at least a low speed zone, a curved speed-change zone and a high speed zone and the lower main segment comprising a platform return zone. The apparatus may further include a second curved speed-change zone and second low speed zone. Drive means in the low speed zones are by rotary screws in the high speed zones by powered wheels engaging the platforms and in the speed-change zones by linear motors. The apparatus may be used as a loading or unloading station for a high speed conveyor belt.

3,747,536

MOBILE TRACK WORKING MACHINE

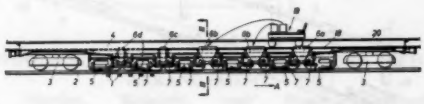
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 17, 1971, Ser. No. 199,679

Claims priority, application Austria, Dec. 17, 1970, A 11351/70

Int. Cl. E01b *29/24*

U.S. Cl. 104—17 R 10 Claims



In a mobile track working machine wherein a plurality of operator's cabins are mounted on the underside of the machine frame and a plurality of storage receptacles holding parts of rail fastening means are associated with the cabins, a vibratory conveyor is mounted between each storage receptacle and the associated cabin for conveying the parts from the receptacle to the cabin.

3,747,537

TURNABLE DIRECTIONING APPARATUS IN AUTOMATIC CARRYING SYSTEM

Mikio Matsumoto, Ashiya; Kenji Terada, Suita, and Mitsuru Matsunaga, Neyagawa, all of Japan, assignors to The Tsubakimoto Chain Mfg. Co., Ltd., Joto-ku, Osaka, Japan

Division of Ser. No. 769,320, Oct. 21, 1968, Pat. No. 3,646,613. This application Nov. 23, 1971, Ser. No. 201,442

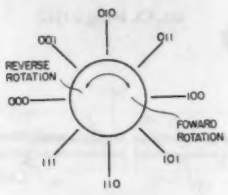
Claims priority, application Japan, Oct. 31, 1967, 42/69578; Oct. 31, 1967, 42/17298

Int. Cl. B01j *1/00*

U.S. Cl. 104—38 1 Claim

A turnable directioning apparatus for use in an automatic carrying system including an electromotive carrying apparatus adapted to run on rails, said apparatus comprising a turnable

member having one section of rail mounted thereon and located at a location at which the end portions of said rails converge and further comprising a direction finder for detecting the direction in which the electromotive carrying apparatus is approaching the turnable directioning apparatus, said turnable member being responsive to the direction finder so that the rail of the turnable member is automatically turned to a direction in line with the rail along which the carrying apparatus is approaching the turnable directioning apparatus.

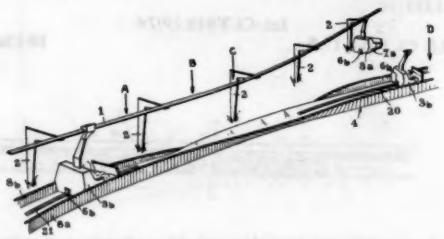


3,747,538

TRANSPORTATION INSTALLATION

Francois L. Giraud, Plaisir, France, assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed June 23, 1971, Ser. No. 155,924
Claims priority, application France, July 6, 1970, 7024983
Int. Cl. E01b *25/26*
U.S. Cl. 104—105 **16 Claims**



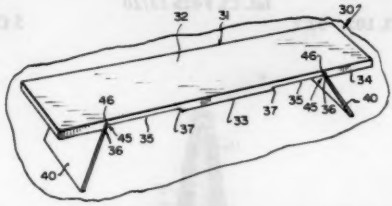
A transportation installation having an overhead conveyor means including a main conveyor, a substantially ground level loading and unloading loop having a decelerator conveyor for receiving cars from the main conveyor and moving them, while slowing their speed relative to the decelerating conveyor, to a loading and unloading station of the loop, and an accelerator conveyor for moving the cars from the station to the main conveyor while accelerating their speed to the speed of the main conveyor. The cars of the transportation installation each have at least one lower carrying wheel movable vertically relative to the car for engaging the accelerating and decelerating conveyors of the loop to cause the car to be supported and moved thereby, and an overhead shoe mounted on the car for vertical movement relative thereto and for engaging the main conveyor and thus suspending the car therefrom. The car also has a hydraulic means for moving the shoe between its lower operative position and upper inoperative position relative to the car, for moving the carrying wheel between its lower operative and upper inoperative position relative to the car, and for automatically operating a braking means of the wheel.

3,747,539

RISER STRUCTURE ASSEMBLY

Carl Calzaretto, 7129 West Ave., Oak Lawn, Ill.

Filed May 7, 1971, Ser. No. 141,284
Int. Cl. A47b *3/08, 7/02*
U.S. Cl. 108—91 **1 Claim**



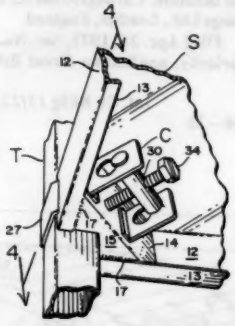
A riser structure which includes a support platform having an upper surface and a lower surface, the support platform including a pair of legs hingedly secured thereto, each of the legs mounted for pivotal movement into an open position and a closed position abutting the lower surface of the support platform whereby when the legs are folded into the closed position, the lower surface of the support platform presents a completely flush surface to permit stacking of a series of riser structures, one upon the other.

3,747,540

CORNER CLAMPS FOR SHELVING AND THE LIKE

Goodwin Salkoff, Coral Gables, and Elmer R. Nusbaum, Hialeah, both of Fla., assignors to Atlas Metal Industries, Inc., Dade, Fla.

Filed Feb. 7, 1972, Ser. No. 223,845
Int. Cl. A47b *3/06*
U.S. Cl. 108—156 **2 Claims**

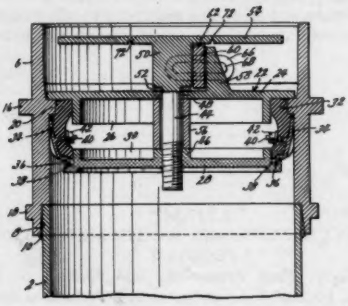


Corner clamps for shelving and the like having rectangular shelves with notches at each corner thereof and a tubular support member positioned at each notch and secured therein by a corner clamp. The corner clamp consists of a U-shaped strap that extends about the tubular support and has leg portions that extend through slots formed in a bracket that is positioned diagonally across the corner and welded to the shelving. A saddle having a notch in alignment with the shelving notch is secured to the bracket. The strap is tightened against the shelving by a lock bolt positioned below the shelf and threaded through a threaded bore in a cross bolt that extends between the ends of the strap and bearing against the saddle.

3,747,541
WALL OR FLOOR SAFE

Dale C. Reese, 2319 Meadow Ln., Salina, Kans.

Filed Mar. 11, 1971, Ser. No. 123,296
Int. Cl. E05g 1/04
U.S. Cl. 109—50 1 Claim

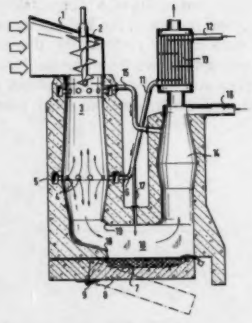


A safe adapted to be embedded in a concrete wall or floor consisting of a hollow body with a cylindrical mouth having an internal flange, and a door consisting of a pair of axially spaced apart circular plates adapted to be disposed coaxially in said mouth, an expandable cylindrical collar of rubber or the like disposed coaxially between said plates, a screw operable to draw said plates closer together whereby said collar is expanded tightly against the inner surface of said mouth and against said flange, rigid locking members carried by said door and movable into operative position by expansion of said collar, and a lock device for securing said screw against rotation.

3,747,542
METHOD AND DEVICE FOR THE TREATMENT OF REFUSE

Tuomo Ruohola; Pauli Unto Juhani Nyberg; Ero Oskari Joutsen, and Kullervo Ennelin, all of Tempere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Claims priority, application Finland, Mar. 18, 1970, 752/70
Filed Mar. 17, 1971, Ser. No. 125,315
Int. Cl. F23g 5/00
U.S. Cl. 110—8 R 14 Claims

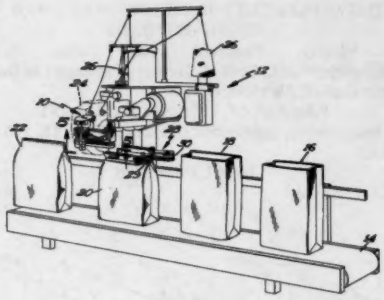


Method and apparatus for the treatment of refuse. The refuse is heated to a sufficiently high temperature to cause the refuse, even metal included therein, to melt. A molten bath is maintained in such a manner that the combustion products are caused to impinge upon the molten bath so that ash, soot, and other particles become entrained in the bath. The heat resulting from the combustion is used to maintain the bath in a molten state.

3,747,543
BAG GUIDING ASSEMBLY FOR BAG CLOSING MACHINE

Irving George Fischbein, Minneapolis; Harold Fischbein, Edina, and Sam Shark, Minneapolis, all of Minn., assignors to Dave Fischbein Manufacturing Co., Minneapolis, Minn.

Filed Sept. 14, 1971, Ser. No. 180,303
Int. Cl. D05b 13/00
U.S. Cl. 112—11 6 Claims

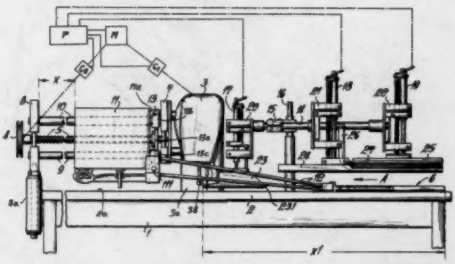


A bag guiding assembly for cooperating with the thread chain cutter of a bag closing machine to aid in the severing of the thread chain interconnecting bag tops which have been stitched closed by the sewing head of the machine. The assembly includes a pair of cooperating rollers rotatably mounted to a frame and located on the downstream side of the thread chain cutter, the rollers and cutter being arranged along a straight line path so that a bag travels along the path past the sewing head and thence to and through the cooperating rollers so as to urge the bag top along the straight line path, the rollers exerting a pulling force on each bag passing therebetween to keep taut the thread chain interconnecting the bag tops and directing the thread chain through the thread chain cutter to insure severance thereof. A power transmission system equipped with a slip clutch drives the rollers and permits stoppage of roller rotation if a bag engaged by the rollers is prevented from moving any further along the path.

3,747,544
SEWING MACHINE WITH IMPROVED BINDER-FEED ARRANGEMENT

Karl Nicolay, Bielefeld, and Heniz Goldbeck, Brackwede/Westf, both of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany

Filed Apr. 17, 1972, Ser. No. 244,780
Claims priority, application Germany, May 11, 1971, P 21 23 160.7
Int. Cl. D05b 3/06
U.S. Cl. 112—65 10 Claims



A double-needle sewing machine for the stitching of bound or piped slits in a fabric workpiece, e.g. a buttonhole or pocket slit in a piece of fabric adapted to form part of a coat or like

outer garment, is provided with a feed arrangement for the binder strip designed to fold the latter into an inverted-T configuration. The latter arrangement is subdivided into a plurality of guide portions and a clamping device so that a portion proximal to the sewing machine may continue to feed the binder strips while a portion remote from the needles can be released to receive the binder strip for the next operating cycle.

3,747,545

SEWING APPARATUS FOR THE FORMATION OF EDGE-PIPING OPENINGS

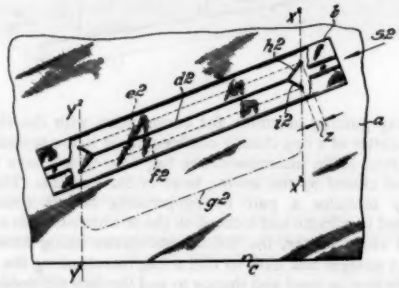
Karl Nicolay, Biedefeld, and Heinz Goldbeck, Brackwede/Westf., both of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany

Filed Apr. 17, 1972, Ser. No. 244,781

Claims priority, application Germany, June 21, 1971, P 21 30 642.3

Int. Cl. D05b *3/06*

U.S. Cl. 112—68 **10 Claims**



A sewing apparatus for stitching a piped-edge or welt border around an opening, e.g., a pocket slot or opening, in a garment fabric, in which the stitching is carried out with a double-needle sewing machine with adjustable interneedle spacing and cooperating with means forming the piping.

3,747,546

BLINDSTITCH SEWING MACHINE

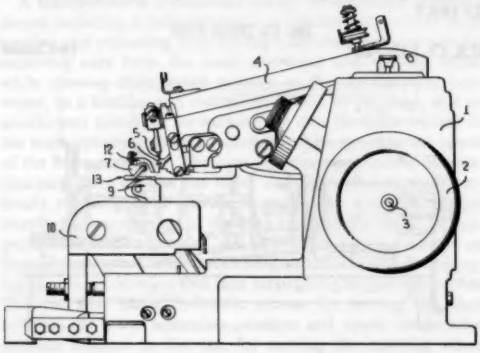
Erwin Jurgens, Stuttgart, Germany, assignor to Union Special Maschinenfabrik GmbH, Stuttgart, Wuerttemberg, Germany

Filed July 12, 1971, Ser. No. 161,517

Claims priority, application Germany, July 29, 1970, P 20 37 502.4; July 29, 1970, P 20 37 503.5

Int. Cl. D05b *1/24*

U.S. Cl. 112—178 **16 Claims**



This disclosure relates to improvements in a blindstitch sewing machine for blind hemming an edge of a material which is doubly reversely folded. A guide member is provided for supporting the folded material when it is elevated by an associated plunger in position for passage of a needle therethrough. The guide member is in the form of a bent length of wire which is gravity urged to its operative position and is disposed in alignment between a plunger and a cloth retaining finger so as to assure the position of the folded material. The plunger is constructed so that it will oscillate and is in the form of a blade-like member pivotally mounted at one end thereof and resiliently urged towards the associated finger.

3,747,547

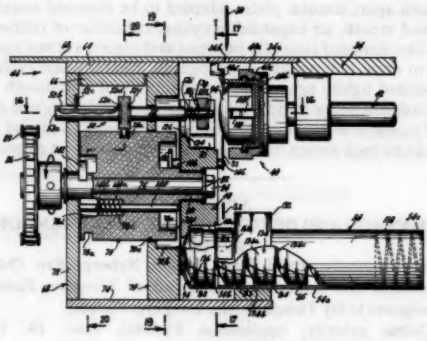
BOBBIN CHANGING MECHANISM METHOD AND PRODUCT

Nathan Mayer, East Brunswick, and Stanley S. Lanes, Matawan, both of N.J., assignors to Bobbin Monitor Corporation, Jamesburg, N.J.

Filed Feb. 23, 1971, Ser. No. 118,148

Int. Cl. D05b *59/04*

U.S. Cl. 112—186 **15 Claims**



Coreless bobbins are loaded from a supply into an empty bobbin case and then automatically transferred into the bobbin holder and hook assembly of a conventional lockstitch sewing machine. Upon runout of the bobbin thread, and upon the signalling of such runout electrically, the empty bobbin case is automatically withdrawn from the holder and hook assembly for reloading and a new loaded bobbin case is automatically inserted into the holder and hook assembly of the sewing machine.

3,747,548

THREAD HOLDING AND CUTTING

Robert V. Brophy, Gloucester, and Fred T. MacKenzie, Beverly, both of Mass., assignors to USM Corporation, Flemington, N.J.

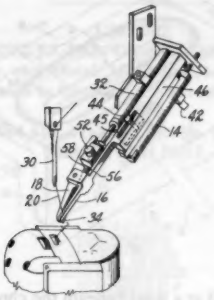
Filed July 14, 1971, Ser. No. 162,375

Int. Cl. D05b *65/00*

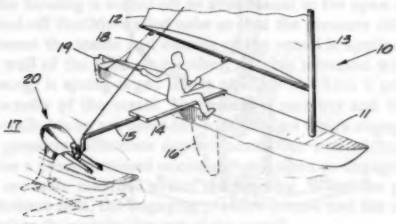
U.S. Cl. 112—252 **8 Claims**

A device for use in sewing machines for holding and cutting thread in which open tongs move from an initial position ad-

jacent the thread into a position straddling the thread. The tongs then close to hold the thread and retract to their initial position while still holding the thread. Immediately after tong closing, a knife is moved across the thread to cut the thread.



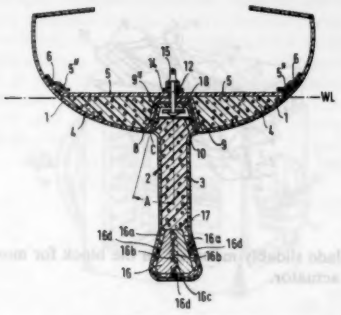
3,747,549
HIGH SPEED SAILBOAT
Sidney G. Shutt, 612 Briarwood Dr., Brea, Calif.
Filed June 8, 1972, Ser. No. 261,076
Int. Cl. B63b *35/00*
U.S. Cl. 144—39 **8 Claims**



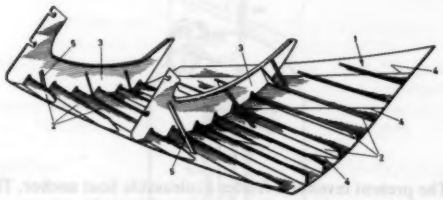
The present invention is an improved downward pulling hydrofoil for use with a sailboat by extending the foil from the windward side of the hull to provide a stabilizing moment equal and opposite to the sail heeling moment. The hydrofoil is provided with a second horizontal foil mounted behind the main holddown foil which second foil is controlled thru a mechanical linkage to keep the main holddown foil tracking in the water for varying wind and sea conditions.

3,747,550
PLASTIC SAILBOAT BODY AND KEEL ASSEMBLY
Helmut Stoeberl, 8201 Eggstaett-Bachham, Germany
Filed Mar. 2, 1972, Ser. No. 231,331
Claims priority, application Germany, Mar. 2, 1971, P 21 09 872.6
Int. Cl. B63b *41/00*
U.S. Cl. 114—39 **27 Claims**

A fiber reinforced plastic boat hull with a tapered bottom recess receiving the upper end of a keel or center board and a floor or partition wall spanning the interior of the hull in spaced relation above the bottom thereof and secured around its periphery to the hull to form a reinforcing strut or stringer. The hull recess and upper end of the keel are of generally frusto-pyramid shape to center the keel in fixed wedged relation with the hull. Foam plastic fills the space between the bottom of the hull and the floor plate. The keel is a hollow molded plastic unit with a weight in the bottom thereof and also filled with foam plastic.



3,747,551
BOAT HULL AND METHOD OF CONSTUCTING THE SAME
Johan Barthus Bennekers, Zaandam, Netherlands, assignor to N. V. Industrieele Handelscombinatie, Holland, Rotterdam, Netherlands
Filed Apr. 26, 1971, Ser. No. 137,463
Claims priority, application Netherlands, Apr. 27, 1970, 7006118
Int. Cl. B63b *3/18*
U.S. Cl. 114—79 W **2 Claims**

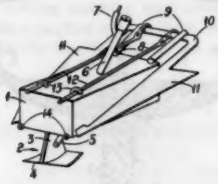


The construction of boat hulls from a plurality of plates is facilitated by welding spaced parallel reinforcing bars to one side of the plate, and then bending the plate only in the direction perpendicular to the bars. The plate is then braced in that bent position and assembled in the hull construction. In the completed hull, the reinforcing bars of one plate will be at an angle to the bars of other plates.

3,747,552
ANCHOR MEANS
Paul Cephas Rhodes, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Jan. 29, 1971, Ser. No. 110,847
Claims priority, application Great Britain, Feb. 18, 1970, 7,791/70
Int. Cl. B36b *21/28*
U.S. Cl. 114—206 R **9 Claims**

A self-embedding anchor comprises a block of non-buoyant material to which is attached a pivotable blade and an actua-

tor to cause the blade to swing into engagement with the surface on which the anchor rests. The anchor also includes at



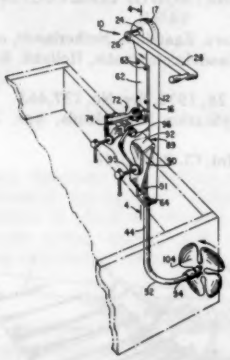
least one blade slidably mounted on tne block for movement by another actuator.

3,747,553

RELEASABLE BOAT ANCHOR

Robert K. Riddle, Sr., 1985 Rockdell Dr., Fairborn, Ohio

Filed July 20, 1971, Ser. No. 164,266
Int. Cl. B63b *21/44*
U.S. Cl. 114—208 A 2 Claims



The present invention relates a releasable boat anchor. The releasable boat anchor has an adjustable spring stopper to allow for selection of the release force needed to operate its unlock mechanism. The releasable boat anchor has notched flukes rotatably attached to an outer cylinder. The edge of an inner cylinder engages the notched flukes prior to release. The notched flukes will rotate when the inner cylinder is pulled out of its notches once the release force needed to pull on its inner cylinder is reached.

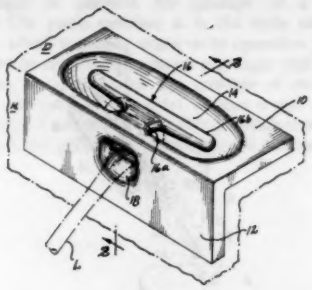
3,747,554

COMBINATION CHOCK AND FAIRLEAD FITTING

Rudolph A. Allen, 4561 Lake Washington Blvd. N.E., Apt. 103, Kirkland, Wash.

Filed June 3, 1971, Ser. No. 149,719
Int. Cl. B63b *21/06, 21/10*
U.S. Cl. 114—218 7 Claims

A combination chock and fairlead fitting for boats and the like is disclosed wherein the chock base and head portions are recessed in the entrance of an upwardly open well in the plate-like top or deck member and a passage comprising a fairlead is formed in the adjoining plate-like side or hull member which adjoins the deck member. The fairlead passage extends



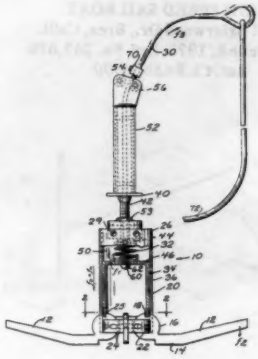
directly into the well at a level beneath the chock. The fitting can also serve as a built-in scupper for vessels requiring the same.

3,747,555

PROPELLING AND STEERING MEANS FOR BOATS

Willard E. Lay, 1810 N. Monitor Ave., Chicago, Ill.

Filed Apr. 1, 1971, Ser. No. 130,102
Int. Cl. B63h *16/14*
U.S. Cl. 115—18 3 Claims



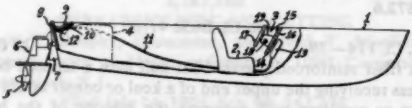
A manually operated propelling and steering means for boats comprising a manually operated rotatable member which when rotated will through gears rotate a flexible shaft and a propeller for propelling the boat and including a manually operated steering member which rotates a rotatable housing within which is positioned the flexible shaft to position the propeller to steer the boat.

3,747,556

POWER BOAT LOCKING ARRANGEMENT

Knut Janne Kjellberg, Hjalteby, Sweden, assignor to AB Volvo Penta, Goteborg, Sweden

Filed Oct. 13, 1971, Ser. No. 188,901
Int. Cl. B63h *25/52*
U.S. Cl. 115—35 1 Claim



A locking arrangement for a power boat having an outboard drive leg steered through a coaxial cable from a steering

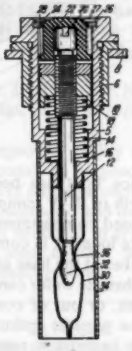
wheel. The arrangement includes a bolt for locking the steering wheel and an electrical switch for controlling the engine ignition.

3,747,557

PRESSURE-RESPONSIVE APPARATUS

Peter K. Bayly, and Alistair McCulloch, both of Victoria, Australia, assignors to Graviner (Colnbrook) Limited, London, England

Filed Apr. 21, 1971, Ser. No. 135,913
Int. Cl. G01l 19/12
U.S. Cl. 116—70 2 Claims



A pressure indicator responsive to the pressure within a fire extinguisher vessel comprises a hollow housing sealed to the vessel wall and extending inwardly of the vessel. The inner end of the housing is sealed off by attachment to the open end of a closed-off flexible-walled tube so that the pressure difference between the inside and outside of the vessel is applied across the wall of the tube. A member, slidably mounted within the housing, is spring-urged into a position in which it protrudes outwardly of the vessel. The movable member and the flexible-walled tube are provided with profiles which engage when the pressure difference applied across the wall of the tube is above a predetermined minimum and, when so engaging, hold the movable member within the housing. When the pressure difference falls, the engaging profiles release and the movable member then protrudes out of the vessel.

3,747,558

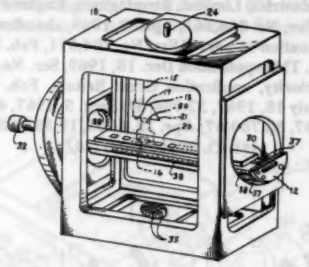
CROSS-MOUNTED MASK CHANGER WITH THICKNESS MONITORING

Abraham Harel, Givataim, Israel, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 170,501, Aug. 10, 1971, abandoned, and a continuation-in-part of Ser. No. 170,531, Aug. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 858,401, Sept. 16, 1969, abandoned, and a continuation-in-part of Ser. No. 858,402, Sept. 16, 1969, abandoned. This application Nov. 3, 1972, Ser. No. 303,437
Int. Cl. C23c 13/08
U.S. Cl. 118—8 6 Claims

A single substrate is exposed in a single pumpdown to vapor deposition from a plurality of evaporation sources. A photo processed mask for each source is mounted on a linearly movable carriage, moving the masks sequentially beneath the substrate for contact with it. The carriage, the substrate holder assembly, a shutter for selecting vapor sources, as well as the sources themselves are all mounted and contained within a Pyrex cross, sealed at each of its ports to sustain a vacuum.

A deposition-monitoring crystal attached to the substrate holder is shielded by plates having different sized holes in the various mask-changer positions. The diameter of the openings in the various shields are adjusted to the specific density and the desired thickness of the vaious evaporants. Monitoring is



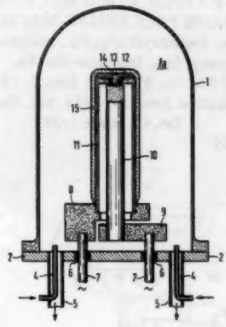
possible in mask changer devices where extended evaporation of successive layers of different materials of various thickness is required.

3,747,559

APPARATUS FOR PRODUCTION OF A CLOSED TUBE OF SEMICONDUCTOR MATERIAL

Wolfgang Dietze, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed May 15, 1972, Ser. No. 253,629
Claims priority, application Germany, May 19, 1971, P 21 25 085.1
Int. Cl. C23c 13/08
U.S. Cl. 118—48 10 Claims

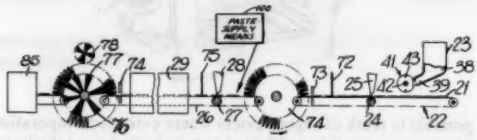


An apparatus comprised of a housing member having an inner hollow chamber, a pair of electrically conductive mounting members electrically insulated from each other and positioned within the chamber, a carbon rod member mounted on one of the mounting members and a carbon tube member mounted on the other of the mounting members concentrically about the rod member, a carbon cap member joining the rod and tube members at their upper surfaces to provide a substantially continuous smooth exterior surface for formation of a tube thereon, means for feeding a gaseous material which includes a semiconductor material into the chamber, means for withdrawing a residual gas from the chamber and means for supplying energy to the mounting means so that the exterior surfaces of the tube member and cap member are uniformly heated and a desired tube closed at one end thereof forms about such heated carbon surfaces.

3,747,560
BATTERY PLATE COATING APPARATUS

Maurice Roberts, Hampton-in-Arden; John Derek Harris, Solihull; Roy William Humpage, Solihull, and Geoffrey George Crow, Solihull, all of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Division of Ser. No. 814,563, April 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 704,011, Feb. 8, 1968, abandoned. This application Dec. 18, 1969, Ser. No. 886,270
Claims priority, application Great Britain, Feb. 17, 1967, 7,698/67; July 18, 1967, 32,996/67; Sept. 5, 1967, 40,536/67; Nov. 27, 1967, 53,780/67; Apr. 25, 1968, 19,591/68
Int. Cl. B05c 7/00, 11/02
U.S. Cl. 118—57 10 Claims

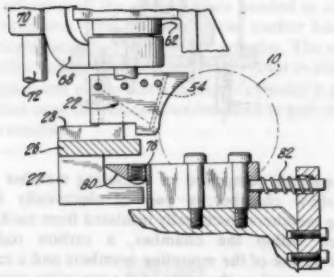


In the manufacture of battery plates, particularly battery plates for lead-acid batteries, paste is placed on a grid in the usual way, but instead of being forced through the grid by a pasting machine as is conventional, the pasted grid is caused to pass through a gap between a probe and a support. The probe dips into the paste and is vibrated at a frequency to cause the paste to flow into the grid.

3,747,561
ADHESIVE APPLICATION MECHANISM FOR ENVELOPE PROCESSING MACHINERY

Herbert W. Heim, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Continuation of Ser. No. 829,326, June 2, 1969, abandoned. This application June 23, 1971, Ser. No. 156,105
Int. Cl. B05c 1/08
U.S. Cl. 118—259 11 Claims

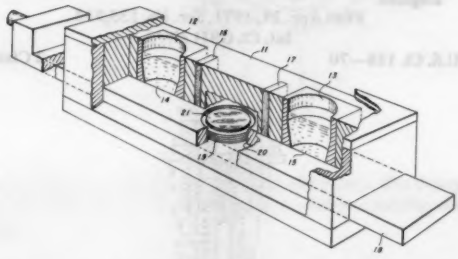


A mechanism for use with envelope processing machinery in which adhesive is applied to the appropriate locations on the envelope blanks. The mechanism is provided with both a remote controlled adhesive box and a structural arrangement in which the adhesive box is automatically opened and closed relative to the adhesive fountain roll. The latter arrangement is spring-loaded and is held in the open position by means of the viscosity of the liquid.

3,747,562
SLIDING FURNACE BOAT APPARATUS

Louis Earl Stone, Richardson, and Roberto Romano, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1971, Ser. No. 147,998
Int. Cl. B05c 3/09; H01l 7/38, 7/46
U.S. Cl. 118—415 6 Claims

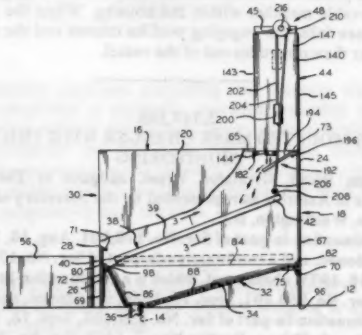


An improved furnace boat has been developed for the epitaxial solution growth of III–V compounds. The boat comprises one or more closed compartments wherein the growth solution or solutions are located, in combination with a sliding substrate support member at the base of the solution compartments, such that the substrate wafer can be moved quickly and easily into contact with, or out of contact with, the growth solution. The technique permits optimum surface protection of the substrate prior to immersion, removal of the slice at any time increment of the growth and/or cooling cycle, and will ensure complete removal of gallium solution from the grown surface without damage to the surface.

3,747,563
ANIMAL OPERATED TOILET

Aubrey Devere Brockhouse, 515 Courtland Ave., Park Ridge, Ill.

Filed Nov. 17, 1971, Ser. No. 199,571
Int. Cl. A01k 29/00
U.S. Cl. 119—1 8 Claims



An animal operated toilet comprising a frame structure defining a drain floor formed with a drain opening and shaped to direct flushing water to said drain opening, and an entrance to the frame structure, a floating treadle applied over the drain floor and hinged at one end thereof adjacent to but spaced inwardly of the entrance to swing between a level or horizontal position under the dog's weight and an upwardly inclined flush down position in which the other end of the treadle projects upwardly and inwardly of the entrance, a flush tank mounted over the inner end of the treadle including a ball type control valve adapted to release a large quantity of flush down liquid

for thorough treadle flush down purposes, and a flush valve actuation arrangement in which the treadle is biased to its upwardly inclined position, and on entry of the dog into the frame structure to defecate, the animal enters on the treadle pressing it to its level position, which conditions the valve actuation arrangement for opening the control valve when the animal leaves the treadle and under the bias that acts on the treadle which returns it to its upwardly inclined position, whereby a large volume water flow is applied to and flushes down the treadle in its inclined position to wash urine and any feces thereon through the drain opening.

3,747,564

METHOD OF PREPARING ANIMAL LITTER

Emanuel M. Bickoff, and George O. Kohler, both of El Cerrito, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 17, 1971, Ser. No. 199,803
Int. Cl. A01k *13/00*
U.S. Cl. 119—1 **8 Claims**

Animal litter of improved quality is prepared from leafy green vegetable material by a procedure which includes removal of precursors of offensive odor-causing elements. The material is washed, compressed and dehydrated, and contains a sufficient amount of ammonia to preserve a given ph level. The material may also contain an active quantity of chlorophyll and be suitably colored.

3,747,565

ARTICLE OF ANIMAL APPAREL

Anne Marie Kellam, 216 W. George Mason Rd., Falls Church, Va.

Filed Nov. 23, 1971, Ser. No. 201,284
Int. Cl. A43b *3/00*
U.S. Cl. 119—1 **7 Claims**

An article of animal apparel adapted to facilitate the bathing of an animal generally including a pair of boots adapted to be worn on a pair of animal's paws, and means secured to the boots and extendable along the leg and body portions of the animal and across the back thereof when the boots are worn on the animal's paws, to retain the boots on the paws.

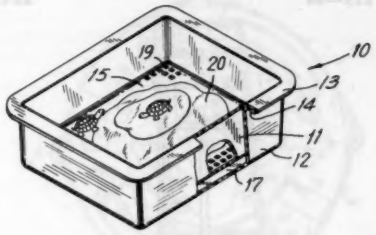
3,747,566

TURTLE TANK

David D. Lovitz, Short Hills, N.J., assignor to Sternco Industries, Inc., Harrison, N.J.

Filed Dec. 22, 1971, Ser. No. 210,917
Int. Cl. A01k *64/00*
U.S. Cl. 119—5 **1 Claim**

A turtle tank adapted for sanitary maintenance, ready cleansing and turtle washing without manually handling and removing the turtles from the tank. An inner tank component for housing turtles is separably nested in a lower outer tank component, said inner component having a floor with perforations and with an elevated island extending above the water level, said floor being positioned above the floor of the lower outer component to provide a base upon which sediment particles and other refuse are deposited by the downward flow of soiled water through said perforations. The said tank components both have outwardly extending flanged peripheries



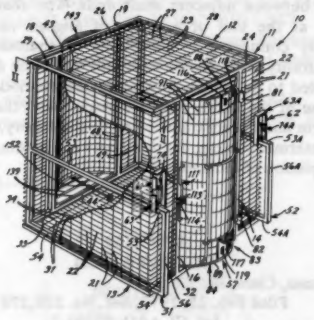
for manual grasping, the flanged periphery of the inner component overlapping and extending outwardly beyond the flanged periphery of the outer component, thereby to facilitate the operative lifting of the inner component with the turtles therein for effecting a drainage of said latter component, the flushing thereof with water and the washing of the turtles.

3,747,567

ANIMAL CAGE WITH PORTABLE CONTAINER

Philip A. De Smit, Portage, Mich., assignor to Unifab Corporation, Kalamazoo, Mich.

Filed Oct. 22, 1971, Ser. No. 191,639
Int. Cl. A01k *31/06*
U.S. Cl. 119—17 **5 Claims**

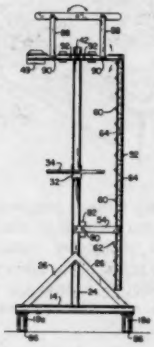


An animal cage having elongated wall means defining an elongated animal retaining housing which has a pair of animal retaining end wall means adapted to cover the ends of the housing. Fastening means are provided for releasably securing one of the end wall means to the housing to provide access to the interior thereof. Carriage means are mounted on the housing and movable longitudinally thereof with the other of the wall means being secured thereto and movable therewith toward and away from the first mentioned end wall means. Coupling means are provided for coupling of the first mentioned end wall means to the second mentioned end wall means. Each of the end wall means is shaped to cooperate with the other to define a relatively small restraining cage to restrain the movements of an animal contained therein. The pair of end wall means, when secured together, are removable as a unit from the housing after the second mentioned end wall means is released from the carriage means.

3,747,568
EGG RACK AND METHOD OF HANDLING SAME

James G. Dugan, Littleton, Colo.; Albert S. Hancock, Jr., Orange City, Iowa; Gene W. Hauaske, Palmer Lake, Colo.; Kenneth G. Huston; Bernard L. Rosenberg, both of Denver, Colo., and Shirley M. Smith, Littleton, Colo., assignors to Robbins Incubator Co., Denver, Colo.

Filed Jan. 21, 1972, Ser. No. 219,782
Int. Cl. A01k 41/06
U.S. Cl. 119—44 22 Claims

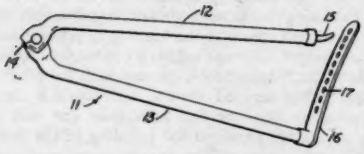


Egg processing rack or dolly and method of handling same characterized by a wheel supported frame having one or more adjacent tiers of rectangular open framework trays pivotally supported on the frame midway between their front and rear ends, and mechanism for simultaneously tilting the trays between predetermined angular positions from the horizontal. Each rack is provided with an oscillatable shaft extending between its upper ends and detachable coupling means disposed between adjacent shaft ends. The shaft on a rack disposed at the end of a series of aligned racks may be detachably connected to oscillating mechanism associated with a plurality of incubator bays into which the aligned racks are adapted to be rolled. In a preferred method of handling and/or use of the racks, they are loaded with the flats at the laying farm and bodily transported to a hatchery, thus obviating any intermediate egg handling between loading at the farm and completion of incubation.

3,747,569
HORSE TWITCH

Paul Hannon, Cisco, Ill.

Filed Feb. 25, 1972, Ser. No. 229,270
Int. Cl. A01k 29/00
U.S. Cl. 119—96 1 Claim

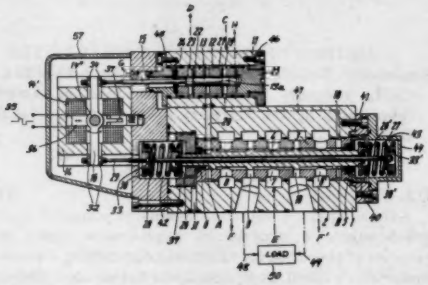


A device comprising two hinged arms with a retaining strap at their free ends adapted to be applied to the nose of a horse or other animal to temporarily restrain said animal.

3,747,570
SERVO VALVE

Werner Rio Versari, Wolfschlugen, and Lothar Kirstein, Bad Kreuznach, both of Germany, assignors to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany

Filed Oct. 18, 1971, Ser. No. 190,218
Claims priority, application Germany, Oct. 22, 1970, P 20 51 753.7
Int. Cl. F16k 11/00
U.S. Cl. 137—625.64 9 Claims

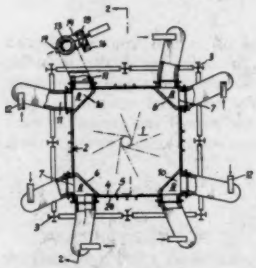


A working piston in a main cylinder and a pilot piston in an ancillary cylinder are linked to opposite ends of a two-arm lever having a floating fulcrum on the shaft of a torque motor whose energization, resulting in a shift of the pilot piston, gives rise to a fluid flow displacing the working piston in the same sense, thereby transmitting to the lever a reaction force which restores the pilot piston to its normal position. The coupling between the lever and the working piston includes a pair of coil springs whose adjustable pressure determines the restoring force and therefore the ratio of input signal to flow rate. The position of the working piston is stabilized by balanced fluid pressures acting upon opposite lands thereof in the normal position of the pilot piston.

3,747,571
PREDRYING TUNNELS FOR MILL DRYING DEVICES

Rudolf Kuhn, Oberhausen, Germany, assignor to Deutsch Babcock & Wilcox Aktiengesellschaft, Oberhausen/Rhineland, Germany

Filed May 11, 1972, Ser. No. 252,447
Claims priority, application Germany, May 13, 1971, P 21 23 681.7
Int. Cl. F22b 29/00
U.S. Cl. 122—235 R 7 Claims



A predrying tunnel for the combustion chamber of a steam generator in which the cooling pipes of the steam generator comprise the walls of predrying tunnels and are arranged horizontally in a vertical superimposed array. The cooling pipes forming the walls of the predrying tunnels extend from gas port inlets at the top of the tunnels downwardly to the level of injection of coal into the predrying tunnels. Hot gases are

drawn from the combustion chamber of the steam generator through the predrying tunnels to dry wet coal injected into the tunnel before it drops to a plurality of mills which pulverize the coal. A plurality of blowers coupled to the predrying tunnels draws the pulverized coal and gases from the tunnel and mills, and forces the gases and coal through the burners of the steam generator into the combustion chamber where the coal is ignited.

3,747,572

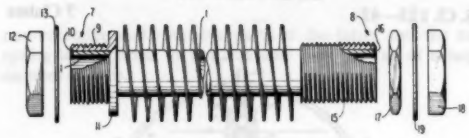
BOILER TUBE END-FITTING ASSEMBLY

Clarence S. Johnson, P.O. Box 940, Pomona, Calif.

Filed Sept. 21, 1971, Ser. No. 182,471

Int. Cl. F22b *37/10*

U.S. Cl. 122—511 **3 Claims**



A boiler tube end-fitting assembly wherein a threaded sleeve is adapted to be slidably mounted on each end of a boiler tube and soldered or brazed thereto, one of the sleeves having a flange adapted to abut the inner face of one end plate of the boiler, the other sleeve having a collar threadably mounted thereon and adapted to abut the inner face of the opposite end plate of the boiler, the threaded sleeves extending through the boiler end plates and secured thereto by washer and nut assemblies tightened against gaskets provided on the outer faces of the boiler end plates.

3,747,573

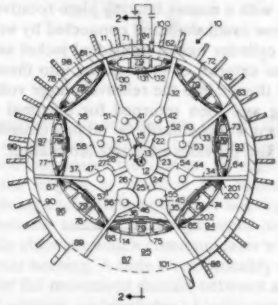
ROTARY VANE DEVICE FOR COMPRESSOR, MOTOR OR ENGINE

Berry W. Foster, 2415 Thomas Ave., Redondo Beach, Calif.

Continuation of Ser. No. 41,008, May 27, 1970, abandoned. This application May 1, 1972, Ser. No. 248,866

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.05 **12 Claims**



A vane device for use as an engine, a compressor, or a motor. At least three vanes are pinned to a central hub and extend through respective slots in a generally cylindrical drum with its axis parallel to and displaced radially from that of said hub, the slots guiding the radial position of the vanes. Synchronizing means, such as a gear train, cause the hub and drum to rotate in the same direction and at the same speed, with the vanes reciprocating and oscillating in the guide slots. A housing encloses the vanes and cooperates with them and the drum to provide a series of working spaces, one for each vane to compress or expand a fluid. Intake and exhaust ports lead fluid into and from the working spaces.

3,747,574

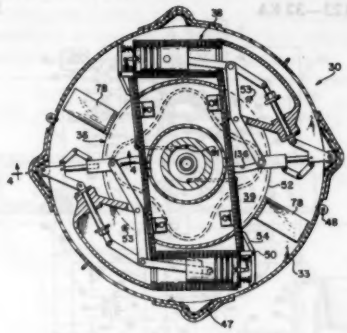
INTERNAL COMBUSTION ENGINE

Edward N. Bland, Seattle, Wash., assignor to Edward Floyd Bland, Seattle, Wash.

Filed June 9, 1971, Ser. No. 151,364

Int. Cl. F02b *57/00, 69/06*

U.S. Cl. 123—21 **12 Claims**



A rotary internal combustion engine having a rotary power unit comprising cylinder assemblies rotating an output shaft about a central axis. The engine while running may be converted between four-cycle and two-cycle operation. An exhaust system employs a chemically treated filter for removing pollutants and provides for reburning a portion of the exhaust. The engine may be run by spark initiated combustion or by spontaneous combustion with fuel injection. Multiple cylinder assemblies may be placed in orbits about the central power shaft for increasing the power of the engine.

3,747,575

LOAD DEPENDENT CONTROL CIRCUIT FOR A GASOLINE FUEL INJECTION UNIT

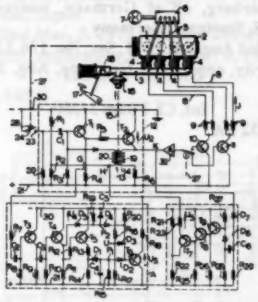
Hermann Eisele, Ditzingen, and Wolfgang Reichardt, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 22, 1971, Ser. No. 126,649

Claims priority, application Germany, Mar. 28, 1970, P 20 15 183.1

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **13 Claims**

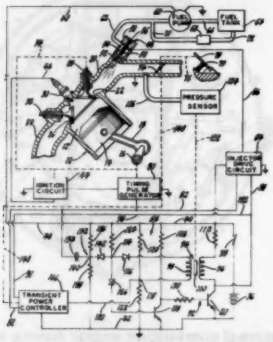


A monostable multivibrator produces fuel injection pulses, the length of which are made dependent on the engine rpm by a control voltage fed to a first voltage divider at the input of the multivibrator. Whenever the pulse exceeds a predetermined length, corresponding to full-load operation of the engine, a time delay circuit connects the second voltage divider in parallel with the first voltage divider so as to diminish the effect of the rpm dependent correction on the pulse length.

3,747,576
ELECTRONIC FUEL INJECTION SYSTEM INCLUDING TRANSIENT POWER COMPENSATION

Colin C. Gordon, Cincinnati, Ohio, and John P. McGavic, Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 24, 1971, Ser. No. 146,166
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA 5 Claims

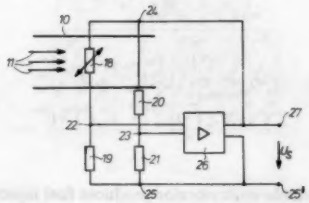


In an internal combustion engine system, the inductance of an inductor is determined in response to the rate of change in the position of a throttle member. At the same time, the inductor is energized with a control current having a magnitude which varies at a constant rate of change. As a result, a throttle voltage is developed across the inductor having an amplitude which is directly proportional to the rate of change in the position of the throttle member. The amount of fuel applied to the engine is regulated as a function of the amplitude of the throttle voltage. Optionally, the amount of fuel delivered to the engine is also controlled as a function of the amplitude of a speed voltage which is proportional to the speed of the engine.

3,747,577
TEMPERATURE-DEPENDENT RESISTANCE ARRANGEMENT FOR CONTROLLING FUEL INJECTION AS A FUNCTION OF AIR INTAKE

Harald Mauch; Dieter Handtmann; Gerhard Haug, all of Korntal; Wolfgang Reichardt, Stuttgart; Hans Zeller, Doffingen; Ernst Zehender, Ottenbronn, and Heinrich Knapp, Silberberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 30, 1971, Ser. No. 176,124
Claims priority, application Germany, Aug. 29, 1970, P 20 42 983.8
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA 15 Claims

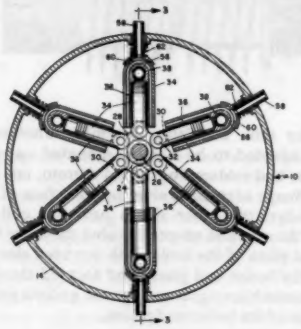


A temperature-dependent resistor is placed in path of air intake. Resistor forms part of a bridge circuit. Amplifier input connected to the diagonal of bridge circuit, amplifier output connected in parallel with the two branches of bridge. Resulting feedback circuit maintains temperature-dependent resistor at a constant temperature by changing current therethrough to compensate for different cooling effects of air stream. Output voltage of amplifier constitutes measure of regulator current through temperature-dependent resistor and therefore measure of air intake. Circuits using amplifier output voltage to control fuel injection also illustrated.

3,747,578
OSCILLATING CYLINDER INTERNAL COMBUSTION ENGINE

Paul D. Pickens, 5746 Dalphin Pl., La Jolla, Calif.

Filed Oct. 26, 1971, Ser. No. 192,042
Int. Cl. F02b *59/00*
U.S. Cl. 123—42 7 Claims



A modified two-cycle internal combustion engine with cylinders generally radially mounted within a housing and oscillating from true radial disposition during each cycle of the engine, the trunnions supporting the cylinders being fixed relative to the housing and being tubular and functioning as fuel inlets with valving ports to the cylinders closed and opened as the cylinders oscillate. As disclosed the engine is of pancake form with a master bearing plate rotatively mounted on a single throw crankshaft and connected by wrist pins with pistons. Each cylinder has an individual jacket and coolant is circulated from exterior of the housing into these jackets individually and thence into the relatively large volume interior of the housing and then returned for maximal cooling and since the coolant will ordinarily be oil in a closed pressurized system this oil also provides adequate lubrication.

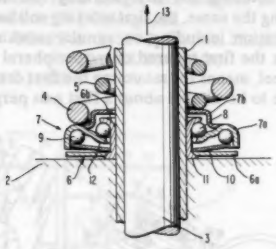
3,747,579
MECHANISM FOR PRODUCING A ROTARY MOVEMENT IN A VALVE OF AN INTERNAL COMBUSTION ENGINE

Werner Altmann, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 21, 1971, Ser. No. 191,409
Claims priority, application Germany, Oct. 30, 1970, P 20 53 325.9
Int. Cl. F01l *1/32*; F16k *29/00*
U.S. Cl. 123—90.3 9 Claims

A mechanism for producing a rotary movement at a valve of an internal combustion engine which essentially consists of a non-rotating and of a rotatable part, of a cup-spring arranged

between these two parts and of balls running on inclined surfaces whereby the inclined surfaces are arranged between the



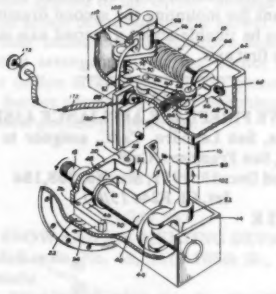
non-rotatable and rotatable parts at the latter and the cup spring is supported at the rotatable part by way of a large number of balls.

3,747,580

FAST IDLE ADAPTOR FOR A DIESEL ENGINE

Czerney L. Savage, 5434 E. DuPont Rd., Fort Wayne, Ind.

Filed Aug. 27, 1971, Ser. No. 173,496
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 J **11 Claims**



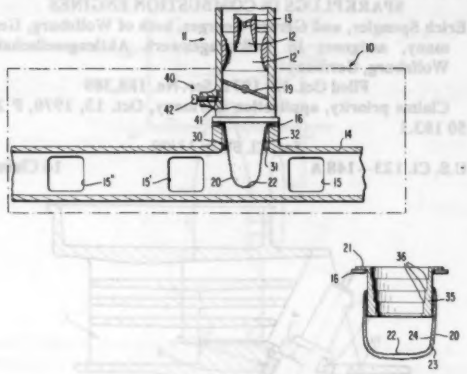
There is provided an adaptor for use on a limiting speed governor of an internal combustion engine which governor includes a speed responsive mechanism for regulating the flow of fuel to the engine to stabilize the speed thereof, the mechanism being enclosed in a governor housing. The adaptor includes a housing secured to the governor housing and has therein a slide chamber which communicates with the interior of the governor housing. A slide is reciprocably received in the slide chamber for movement therein between a retracted and an extended position, and includes a biasing means coupled to the slide and extending inwardly of the governor housing for biasing the speed responsive mechanism in a direction to increase the fuel flow to the engine when the slide is in its extended position and which means is disengaged therefrom when in its retracted position. The biasing means is further resiliently compressible in resonse to operation of the speed responsive mechanism whereby the speed responsive mechanism is able to regulate the flow of fuel to the engine to stabilize the speed thereof. There are also provided means movably received in the control housing and engaged with the slide for selectively moving the slide between its retracted and extended positions.

3,747,581

METHOD AND MEANS FOR REDUCING POLLUTANTS IN EXHAUST FROM INTERNAL COMBUSTION ENGINES

Richard G. Kolb, 5510 Harvest Scene Lane, Columbia, Md.

Filed Feb. 17, 1971, Ser. No. 116,131
Int. Cl. F02m *29/00*
U.S. Cl. 123—141 **2 Claims**



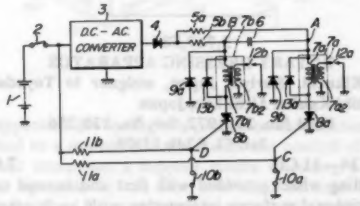
A portion of the contaminants in ICE exhausts has its origin in intake of fuel in droplet rather than vapor form. This invention provides two cooperating means of assuring evaporation of the fuel before intake. A venturi throat is provided in a passage after mixing of fuel with intake air in a conventional carburetor having a venturi throat. This second venturi throat provides a pressure reduction in the intake mixture following carburation which causes much of the fuel still in droplet form to evaporate. A low resistance catching filter or screen is placed in the path of the intake mixture after the second venturi throat such as to collect droplets there existing such as those which were too large to be evaporated by the pressure reduction at the pressure reduction throat. These droplets are collected and evaporated in a region of elevated temperature in close proximity to the cylinders while being reduced in volume to be evaporated by the second venturi evaporator.

3,747,582

IGNITION SYSTEM FOR MULTICYLINDER INTERNAL COMBUSTION ENGINE

Minoru Kato, Kariya, Japan, assignor to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed Mar. 3, 1972, Ser. No. 231,470
Claims priority, application Japan, Mar. 6, 1971, 46/11940
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **6 Claims**



An ignition system for a multicylinder internal combustion engine comprising an ignition power source, a capacitor, a pair of charging circuits, a pair of discharging circuits, a pair of ignition coils each having a primary and a secondary winding, and at least one ignition plug connected to each of the secondary windings of the ignition coils. In the system, the

charging circuits are arranged to charge the capacitor in directions opposite to each other, and the primary windings of the ignition coils are disposed in such circuit portions of the discharging circuits where these circuits do not overlap each other.

3,747,583

QUICK INSERTION ARRANGEMENT ESPECIALLY FOR SPARKPLUGS IN COMBUSTION ENGINES

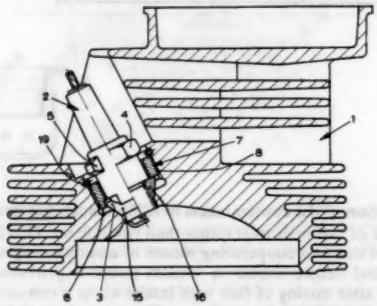
Erich Spengler, and Gerard Georges, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Oct. 12, 1971, Ser. No. 188,389

Claims priority, application Germany, Oct. 13, 1970, P 20 50 183.1

Int. Cl. F02p *13/00*

U.S. Cl. 123—148 A **14 Claims**



In a motor vehicle having a combustion engine including cylinder heads and walls and operable with an ignition plug, an arrangement for the quick insertion of the ignition plug comprising a sleeve having a thread formed thereon about its outer surface for cooperation with a correspondingly formed thread in a recess made in the cylinder wall, an inner profile formed on the sleeve, a first profile formed on the ignition plug cooperating with the inner profile of the sleeve and allowing insertion of the insertion with plug into the sleeve in the axial direction, the outer first profile on the ignition plug being constructed to cooperate with means formed on the sleeve to retain the ignition plug in the sleeve after a predetermined rotation of the ignition plug in the sleeve, a second outer profile formed on the ignition plug in the sleeve, a second outer profile formed on the ignition plug for the application of an appropriate tool thereto for the rotation of the ignition plug, means limiting the rotation of the ignition plug, in the sleeve whereby the application of a rotational movement by the tool will cause the rotation of the sleeve and to establish a threaded engagement between the sleeve and the thread formed in the recess.

3,747,584

ROTARY DRESSING APPARATUS

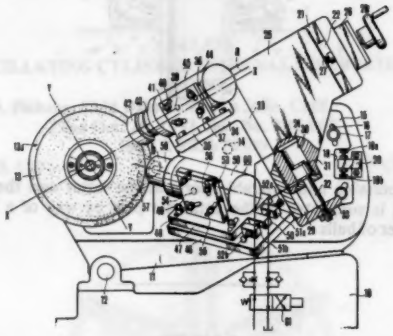
Makoto Kikuchi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed Jan. 24, 1972, Ser. No. 220,256

Int. Cl. B24b *53/06*

U.S. Cl. 124—11 CD **7 Claims**

A grinding wheel provided with first and second tapered outer peripheral surfaces intersecting with each other at a predetermined angle and a reentrant curved surface on the outer edge of the second tapered outer peripheral surface is dressed by rotary dressing apparatus having first and second working rolls. The rotary dressing apparatus comprises a feed carriage slidably mounted on the grinding wheel carriage, means for feeding the feed carriage toward the grinding wheel, a slide base slidably mounted on the feed carriage, means for moving the slide base in a direction perpendicular to the path of the movement of the slide carriage in parallel with a tangent line of the outer periphery of the grinding wheel, a first dressing head including the first working roll and driving means for totating the same, the first working roll having a cup shaped configuration including an annular working surface adapted to work the first tapered outer peripheral surface of the grinding wheel, means for mounting the first dressing head on the slide base to be tiltable about a first axis perpendicular



to the path of the movement of the slide base, a second dressing head including the second working roll and driving means for rotating the same, the second working roll having a cylindrical working surface adapted to work the second tapered outer peripheral surface, the outer edge of the cylindrical working surface of the second working roll being adapted to work the reentrant curved surface of the grinding wheel, and means for mounting the second dressing head on the slide base to be tiltable about a second axis substantially parallel with the first axis.

3,747,585

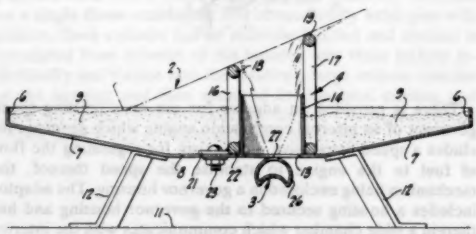
DECORATIVE FIREPLACE APPLIANCE ASSEMBLY

George F. Coats, San Leandro, Calif., assignor to Hurricane International, San Francisco, Calif.

Filed Dec. 15, 1971, Ser. No. 208,184

Int. Cl. F24c *15/00*

U.S. Cl. 126—92 R **15 Claims**



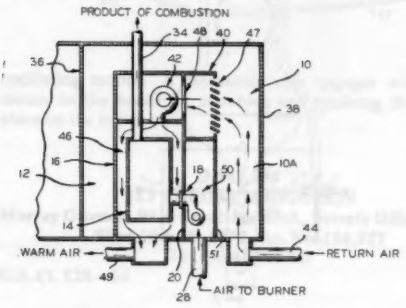
A decorative fireplace appliance assembly including a simulated non-combustible log structure supported above an improved support pan having a flame source in the form of a gas burner extending beneath the support pan. The pan is provided with a central opening, preferably elongated and slot shaped extending from adjacent one end of the pan to the other, located directly beneath the log structure to permit flame to be directed upwardly into contact with the undersurface of the log structure. The pan opening is surrounded by a support unit defined by a rim member contoured in accordance with the shape of the pan opening to which log structure support rod members are integrally connected. The pan base is concavely contoured to receive sand or other decorative particulate matter therein beneath the log structure.

3,747,586

BURNER ARRANGEMENT FOR SEALED COMBUSTION TYPE SYSTEMS

Frank F. Weiss, Park Ridge, Ill., assignor to Mid-Continent Metal Products Co., Chicago, Ill.

Filed Feb. 2, 1972, Ser. No. 222,825
Int. Cl. F24h 3/10
U.S. Cl. 126—110 B 9 Claims



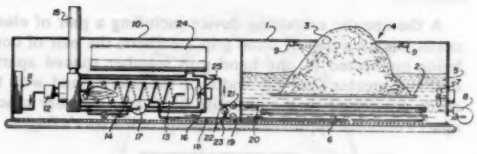
A burner arrangement for sealed combustion type furnace systems of the gaseous fuel consuming type in which a constant burning pilot is used, wherein a check valve controlled connection between the furnace plenum chamber, from which heated air is circulated by a circulation blower for heating purposes, is provided to supply air to the pilot to avoid extinguishment of the pilot by backflow of products of combustion due to wind conditions acting on the furnace flue or negative pressure conditions applied to the burner, through leakage in the system, by the action of the circulation blower. The burner arrangement also includes a combination main and vernier shutter control arrangement for the burner blower, and a change over orifice arrangement in the gaseous fuel supply lines in the burner permitting ready switching of the burner between natural gas and propane gas.

3,747,587

SNOW AND ICE MELTING DEVICE

Robert L. McKenzie, No. 45, 5619-105th St., Edmonton, Alberta, Canada

Filed Nov. 8, 1971, Ser. No. 196,371
Int. Cl. E01c 11/24; E01h 5/00
U.S. Cl. 126—343.5 R 5 Claims



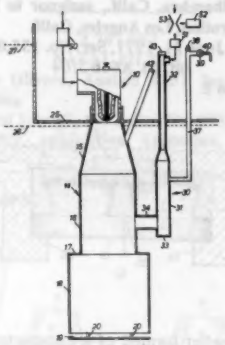
A device for melting frozen water comprising a melting chamber, inlet means in said chamber for introducing said frozen water therein, a heat exchanger disposed in said chamber and arranged to heat water in which said frozen water is at least partially submerged, means for withdrawing water from said chamber, heating means for heating a heat transfer fluid and means for recirculating said heat transfer fluid between said heating means and said heat exchanger.

3,747,588

OIL BURNING SUBMERGED COMBUSTION UNITS

Christopher John Booth, Chester, England, assignor to C. & W. Walker Limited, Donnington, near Wellington, Shropshire, Great Britain

Filed June 10, 1971, Ser. No. 151,881
Int. Cl. F24h 1/20
U.S. Cl. 126—360 A 18 Claims



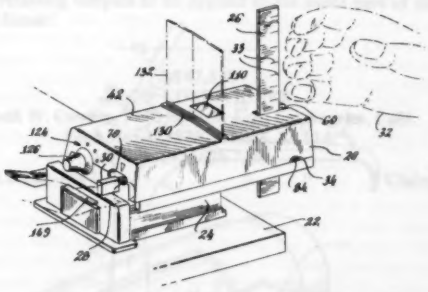
In an oil burning combustion unit a mixture of oil and combustion air is directed downwards into a combustion chamber submerged in a liquid, and having a step at which its cross-section increases in a downward direction. It is made from a single thickness of metal with its inner surface exposed to the flame and its outer surface immersed in the liquid.

3,747,589

REACTION TIME TESTING APPARATUS

Larry Harrison, Clifton Springs; Robert VanValkinburgh, Pittsford, and Robert Kalvitis, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

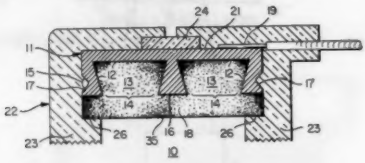
Filed May 19, 1971, Ser. No. 144,938
Int. Cl. A61b 5/16
U.S. Cl. 128—2 N 15 Claims



An apparatus for testing the psycho-motor reaction of one individual to a sensual stimulus under the control of another individual comprises a support means including a support member operable by the first individual between first and second positions for constraining an upstanding, elongatated rectilinear measuring body when said support member is located at said first position and for releasing said body through the movement of said support member to said second position thereby permitting the measuring body to freefall. Means are provided for generating a sensual stimulus when said operable support member is moved to the second position thereby alerting a second individual being tested to grasp the

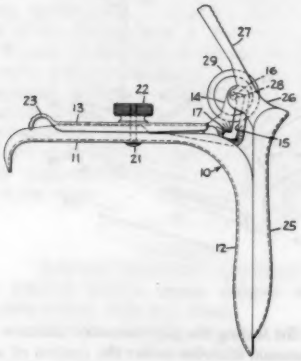
freefalling body. The support means for the measuring body is enclosed in a housing and is demountably secured to a planar surface.

3,747,590
BIOPOTENTIAL ELECTRODE
Frank Motley, Alhambra, Calif., assignor to National Cable Molding Corporation, Los Angeles, Calif.
Filed June 21, 1971, Ser. No. 155,048
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 E **13 Claims**



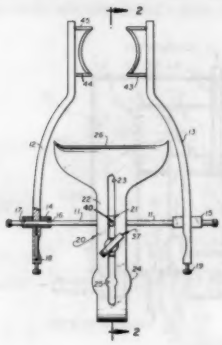
An electrode pellet formed of a compacted powder electrode material is held in a metal receptacle having a restricted opening. An electrically conductive lead is affixed to the exterior surface of the receptacle at a point removed from the opening. The receptacle and pellet with lead attached are encapsulated in a unitary plastic housing having a restricted opening which exposes a surface of the pellet. The housing is formed of a plastic crush pad and a molded plastic body which are fused together during encapsulation to provide a seamless one-piece case.

3,747,591
VAGINAL SPECULUM
Boris A. Golden, 720 Park Pl., Niagara Falls, N.Y.
Filed Mar. 11, 1971, Ser. No. 123,169
Int. Cl. A61b *1/32*
U.S. Cl. 128—17 **5 Claims**



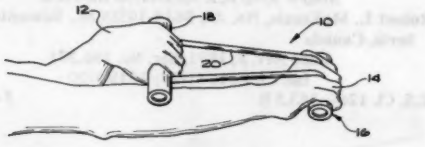
A vaginal speculum of the type wherein a pair of dilator blades are movable apart and pivoted for dilation of a body cavity. One blade conventionally projects beyond the other. In the present invention the blades are adjustable lengthwise relative to each other so that this projection of the blades may be selectively reversed to permit use of the instrument in reverse position.

3,747,592
MULTIPLY ADJUSTABLE SURGICAL RETRACTOR
Manuel Valente Santos, 115 Ferry St., Newark, N.J.
Filed June 30, 1970, Ser. No. 51,179
Int. Cl. A61b *17/02*
U.S. Cl. 128—20 **7 Claims**



A multiply adjustable surgical retractor particularly well adapted for abdominal surgery comprising a single mounting shaft carrying a pair of opposed arms slidably mounted thereon and movable in a common plane, the free end of each of the arms carrying a depending, incision engaging hook, and a central arm mounted on the shaft slidably movable along the shaft, pivotal about the axis of the shaft and extensible transversely to the axis of the shaft, and an incision engaging blade on the free end of the central arm, the central arm being engaged to the shaft by means of a clamp which is adapted to fix the position of the central arm relative to the shaft when desired.

3,747,593
HAND EXERCISER
Ward T. Taylor, 1537 N. Gow, Wichita, Kans.
Filed June 12, 1972, Ser. No. 262,073
Int. Cl. A61h *1/02*
U.S. Cl. 128—26 **7 Claims**

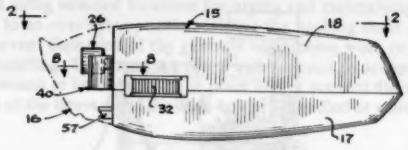


A therapeutic exercising device including a pair of elastic cords joining a pair of hand grip members, the pair of cords being connected to one hand grip member spaced apart a distance greater than the width of the user's hand with the cords connected to the opposite hand grip member spaced apart a distance approximate the width of the user's finger.

3,747,594
PORTABLE ELECTRIC APPLIANCE
Walter F. Bishop, Bloomingdale, Ill., assignor to A. F. Dormeyer Manufacturing Co., Chicago, Ill.
Filed Nov. 19, 1971, Ser. No. 200,374
Int. Cl. A61h *7/00*
U.S. Cl. 128—49 **4 Claims**

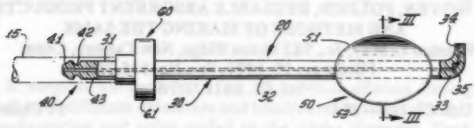
The appliance includes a hand-held motor unit with a motor output end for receiving a plurality of interchangeable working tool heads wherein the motor transmits power to the heads for operating same. An eccentric is provided on the output

shaft of the motor for engagement with a yoke on a work tool head to convert rotary motion of the motor to reciprocating or



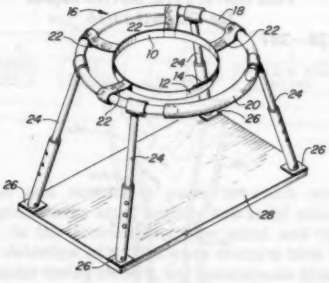
oscillating motion. A releasable clip engages with socket means on the heads for attaching and retaining the head in place on the motor unit.

3,747,595
JET THROAT IRRIGATION
Murray Grossan, 8930 Sepulveda Blvd., Beverly Hills, Calif.
Filed June 18, 1971, Ser. No. 154,557
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **8 Claims**



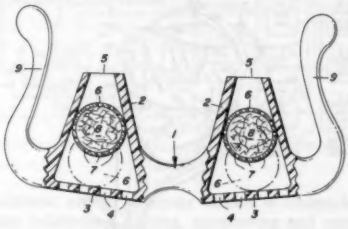
A throat irrigator including a conduit, with an outer end for fluid connection to an open end of a flexible hose from a source of pulsating pressurized fluid; with an inner nozzle directed substantially perpendicularly to the conduit axis for discharging a pulsating stream of fluid; and with a pair of symmetrically disposed outwardly concave curved surfaces formed on upper and lower longitudinally bowed plates or on a block on the conduit adjacent the nozzle end whereby, upon insertion of the irrigator into the mouth, the lower curved surface rests on the crown of the tongue to depress it, while the upper curved surface serves as a seat or rest for the thumb or finger of the user, to facilitate pivotal movement of the nozzle during jetting discharge of the fluid therefrom toward the side of the throat for washing a tonsil or other area of the throat.

3,747,596
APPARATUS FOR SUPPORTING A SMALL CHILD IN STANDING POSITION
Susan C. Mills, 1 Vernon Rd., Scituate, Mass.
Filed Mar. 9, 1971, Ser. No. 122,358
Int. Cl. A61g *13/00*
U.S. Cl. 128—134 **23 Claims**



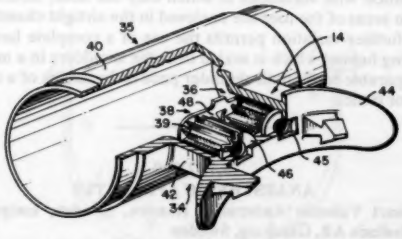
A web for girdling a child at armpit level is supported within an outer rigid curved support by a plurality of flexible connecting webs attached between the child-girdling webs and the rigid support. Connecting straps are provided on the support and coupled with the girdling web, the lengths of the connecting straps being adjustable. The rigid support is mounted so that its height is also adjustable. All or portions of the girdling web may be elastic or inelastic and one or all of the connecting straps may be elastic or inelastic. The rigid support is carried by a free-standing mount or is attached to a mount adapted to be secured to a wall.

3,747,597
NASAL FILTER
Virgilio Andres Olivera, Austria 2251 3er Piso A, Buenos Aires, Argentina
Filed July 27, 1972, Ser. No. 275,559
Claims priority, application Argentina, Nov. 3, 1971, 238,822
Int. Cl. A61m *15/08*
U.S. Cl. 128—140 N **2 Claims**



The present invention refers to a nasal filter, characterized by the fact of being formed by a body having two hollow projections which can be located in the nasal fossae and which are provided with respective frusto-conical chambers the major bases of which are closed and provided with a plurality of holes, the minor bases being open; said chambers having two corresponding spheroidal hollow members the laminiform facings of which are perforated and their diameters being somewhat larger than the inside diameters of the minor bases and considerably smaller than the diameters of the major bases of said projections, said spheroid members being filled with filtering substances and said projections being provided with retaining temples to be applied to the outer part of the nasal fossae.

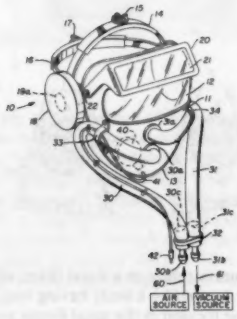
3,747,598
FLOW CONDITIONER
Kenneth W. Cowans, 3118 Patricia Ave., Los Angeles, Calif.
Filed May 4, 1970, Ser. No. 34,114
Int. Cl. A62b *7/06*
U.S. Cl. 128—142 **5 Claims**



A respiratory gas flow conditioner for providing biologically required heat and moisture to gas flows for a respiring user has high thermal efficiency and low resistance to respiratory flow. The flow conditioner comprises a cylindrically shaped, hollow, high surface area heat and moisture regenerator having a relatively large orifice at one longitudinal end. Exhaled gases

having relatively high heat and moisture content pass into the orifice, expand omnidirectionally, pass uniformly through the regenerative material comprising the sides of the cylinder and give out heat and moisture thereto; inspiratory gases at relatively low humidity and temperature take up the moisture and heat retained by the regenerator and pass to the respiratory organs of the user at biologically desirable humidity and temperature levels.

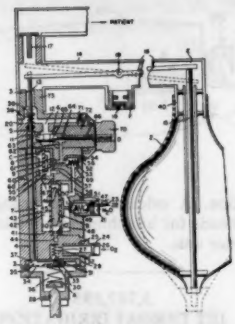
3,747,599
BACTERIAL CONTROL MASK
Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio
Filed May 28, 1971, Ser. No. 147,859
Int. Cl. A62b *17/04*; A61b *19/00*
U.S. Cl. 128—142.7 **7 Claims**



An operating mask for protection of the operator from airborne bacteria and viruses during dental operations. One form of mask includes a cup which encloses at least the nose, mouth, and chin areas of the face of the wearer and which is made of a rigid material, with a peripheral gasket secured to it. The mask is carried by a headband, and use of the gasket and adjustment of the headband permit an air-tight chamber to be formed. The mask also includes air inlet means and exhaust means so that purified air can be forced into the chamber formed by the cup, while contaminated air can be evacuated completely away from the atmosphere in which the operation takes place. Communication means are also provided as well as means for protecting the hearing of the user. Protection of the eyes from trauma and infection and aids for sharper visualization and protection of visual acuity are also provided. In the preferred form of the invention, the entire face is enclosed, but it is possible to utilize the general principles of the invention with variations in which only the nose, mouth, and chain areas of the user are enclosed in the airtight chamber. A still further variation permits the use of a complete head-enclosing helmet which is sealed over the shoulders in a manner comparable to football shoulder pads or by means of a cuffed suit or tunic.

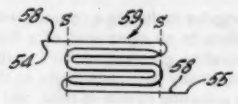
3,747,600
ANAESTHETIC APPARATUS
Lennart Valentin Anderssoa, Handen, Sweden, assignor to Mediada AB, Gateborg, Sweden
Filed Oct. 30, 1970, Ser. No. 85,633
Claims priority, application Sweden, Mar. 9, 1970, 3076/70
Int. Cl. A61m *16/00*
U.S. Cl. 128—188 **3 Claims**

An anaesthetic apparatus for analgesic narcosis using a mixture of oxygen gas and nitrous oxide gas, said apparatus being equipped with an inlet valve for the oxygen gas, a pressure regulator for same, a pressure-controlled balance regulator for the nitrous oxide gas and a proportioning valve for regulation of the oxygen nitrous gas mixture, which apparatus is executed



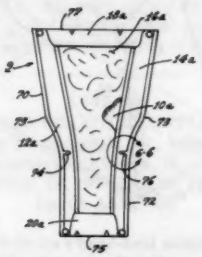
as a homogenous block and in which the connections between the components are arranged as internal channels.

3,747,601
WOVEN, FOLDED, REUSABLE ABSORBENT PRODUCTS AND METHODS OF MAKING THE SAME
Winston L. May, Jr., 982 Ponus Ridge, New Canaan, Conn.
Filed Apr. 19, 1971, Ser. No. 135,291
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **11 Claims**



Woven, folded, reusable absorbent products such as diapers, panty pads, surgical dressings, general use sponges and pads, compresses, and the like, comprising a plurality of interior layers and outer layers, the interior layers comprising multi-ply, highly absorbent fabric layers, preferably of gauze, and the outer layers comprising single-ply, stronger, more abrasion resistant, longer-wearing, fabric layers, preferably of birdseye, all of the layers being integrally fabricated at the same time in a single weaving operation and subsequently folded, as desired or required. Methods of making such absorbent products are also involved.

3,747,602
ABSORBENT LINER AND HOLDER PORTION OF A SANITARY GARMENT
Harold J. Ralph, 2002 E. Santa Clara Ave., Santa Ana, Calif.
Filed Nov. 9, 1970, Ser. No. 88,045
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **13 Claims**



The liner-holder portion of a garment for incontinent persons comprising a flexible moisture-impervious backing sheet

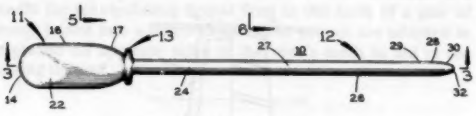
and flaps forming a reservoir and adapted to receive insertably liquid absorbent liners. The flaps are attached along the peripheral edge of the backing sheet, and stub seams are provided along selected locations for urging and maintaining the flaps to an overlaying position relative the backing sheet so as to prevent distortion of the garment when being worn or during handling. The liners are fitted with recesses to accept the stub seams to hold the liners in place and to prevent dislodgement of the liners when the liner-holder is handled or worn.

3,747,603

CERVICAL DILATORS

Barry G. Adler, 49 Pomona Rd., Suffern, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,138
Int. Cl. A61m *29/00*; A61b *17/36*
U.S. Cl. 128—341 **10 Claims**



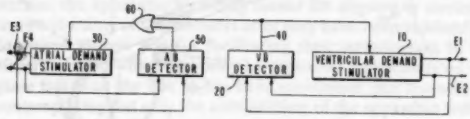
A surgical kit includes a set of cervical dilators having probes of different diameters and handles of identical size and configuration and color coded to the probe diameter. Each dilator is integrally formed of a synthetic polymer and includes a downwardly angulated probe of uniform diameter except at its distal end where it is tapered to the axis between 0.5° and 1.5° from between 0.5-2.0 inches from its rounded tip for a distance between 0.5 and 2.0 inches. A handle is formed at the probe proximate end and is relatively flat with a finger accommodating depression in its lower face and is provided with a circular shield adjacent the probe.

3,747,604

ATRIAL AND VENTRICULAR DEMAND PACER WITH SEPARATE ATRIAL AND VENTRICULAR BEAT DETECTORS

Barouh V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 884,825, Dec. 15, 1969, Pat. No. 3,661,158. This application Dec. 6, 1971, Ser. No. 205,195
Int. Cl. A61n *1/38*
U.S. Cl. 128—419 P **7 Claims**



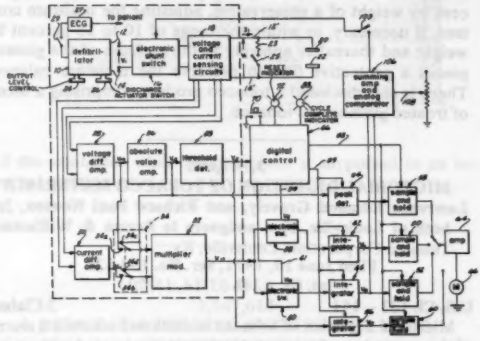
An atrial and ventricular pacer in which competition between spontaneous atrial activity and atrial stimulation is prevented. In the conventional type atrial and ventricular pacer, the detection of a QRS wave re-starts both the atrial and ventricular timing circuits, but spontaneous atrial activity does not inhibit the generation of an atrial stimulating pulse. In the description of an illustrative embodiment contained herein, by preventing the generation of such a pulse when a spontaneous atrial beat is detected the batteries have a longer life.

3,747,605

DEFIBILLATOR AND METHOD AND APPARATUS FOR CALIBRATING, TESTING, MONITORING AND/OR CONTROLLING A DEFIBRILLATOR OR THE LIKE

Kenneth J. Cook, Oak Park, Mich., assignor to William Beaumont Hospital, Royal Oak, Mich.

Filed Oct. 20, 1971, Ser. No. 190,750
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 D **25 Claims**



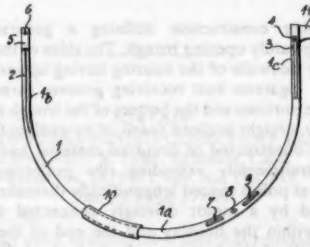
An electronic energy analyzer circuit is connected to a defibriliator calibrating, testing, monitoring and controlling the energy output of the defibrillator used for treating certain cardiac conditions. Voltage and current of the defibrillator output are sensed and the resultant signals are multiplied to provide a power function which is then integrated to provide measurement of the total energy delivered. Energy measurements are performed separately on positive and negative half cycles of the defibrillator output. The time duration of the treatment and the peak voltage applied to the patient are also monitored. The defibrillator includes an auxiliary precision source to the calibrate meter scales in the analyzer. A dummy load is also provided to test the defibrillator output prior to treatment. During treatment, the energy actually delivered to the patient can be either controlled at a selected level or monitored.

3,747,606

STAY FOR BRASSIERE CUPS

Georges Tareau, 123 rue Lafayette, 75 Paris 10 eme, France

Filed July 27, 1971, Ser. No. 166,489
Claims priority, application France, June 8, 1971, 71/20680
Int. Cl. A41c *3/00*, *1/20*
U.S. Cl. 128—472 **3 Claims**



The stay for brassiere cups is made of two flat ring bows of plastic material for surrounding the rear portion of each cup of the brassiere, each ring bow comprising one half-circular element extended by straight arms.

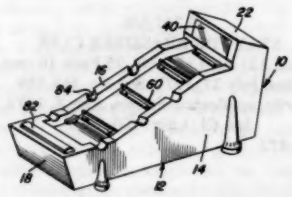
3,747,607
PROCESS FOR PRODUCTION OF TOBACCO COMPOSITION AND COMPOSITION MADE HEREBY
Tae Hak Kim, 112 Inidong, Chongroku, Seoul, South Korea
Filed Dec. 14, 1971, Ser. No. 207,989
Int. Cl. A24b *15/00*
U.S. Cl. 131—140 B 2 Claims

There is disclosed a process for treating ginseng to render it suitable for use as an additive in a tobacco product. The process comprises cutting ginseng into small pieces, dyeing the pieces a tobacco color, adding from about 0.2 to 1.0 percent by weight of a preservative, adjusting the moisture content, if necessary, to within the range of 10 to 15 percent by weight and thereafter applying to the surfaces of the ginseng pieces a protective film to preserve the moisture balance. There is also disclosed a tobacco product comprising a blend of treated ginseng and tobacco.

3,747,608
MICROBIAL DIGESTION OF TOBACCO MATERIALS
Lawrence Edmond Gravely, and Richard Paul Newton, Jr., both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed June 18, 1971, Ser. No. 154,624
Int. Cl. A24b *03/14, 15/00*
U.S. Cl. 131—141 3 Claims

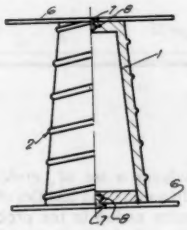
Microbial digestion of tobacco is disclosed wherein a slurry of the pectin bound tobacco plant matter is treated with an inoculum containing pectolytic-enzyme producing organisms selected from the class of Erwinia carotovora, Erwinia atroseptica, Erwinia aroideae, Bacillus polymyxa and Streptomyces cellulosae. The slurry is maintained at a pH of 5.2 to 8.5 under proper environmental conditions to organism growth and resultant fibrillation. Termination of the organism activity is effected by heating and the final step involves sheeting of thickened slurry.

3,747,609
MOTORIZED SELF-DUMPING ASHTRAY
Lee S. Giessner, 2829 Eoff St., Wheeling, W. Va.
Filed Sept. 2, 1971, Ser. No. 177,281
Int. Cl. A24f *15/08*
U.S. Cl. 131—240 R 1 Claim



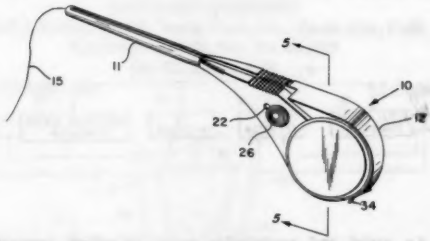
A housing construction defining a generally straight inclined upwardly opening trough. The sides of the trough are defined by sidewalls of the housing having upwardly opening transverse cigarette butt receiving grooves formed in their upper edge portions and the bottom of the trough is defined by a generally straight inclined reach of an endless flexible conveyor belt constructed of fireproof material and having upstanding transversely extending ribs projecting upwardly therefrom at points spaced longitudinally therealong. The belt is powered by a motor drivingly connected thereto and disposed within the housing and the end of the aforementioned reach of the belt toward which the belt is drivable curves downwardly into the housing and back underneath the aforementioned belt reach whereby cigarette butts disposed on the belt may fall therefrom within the housing and be collected in upwardly opening receptacle provided for this purpose. The receptacle will be removably supported from the housing for ease in emptying the receptacle and the housing is provided with at least one translucent panel having opaque or distinctive colored translucent advertising indicia thereon. An intermittent operable light source is disposed behind the translucent panel within the housing and an electrical power source is also disposed within the housing for flashing the illumination means whenever the motor for the conveyor belt is driving the same.

3,747,610
DEVICE FOR THE HELICOIDAL MOULDING AND UNMOULDING OF NATURAL AND ARTIFICIAL FIBRES, ESPECIALLY HAIR
Martin Llahi Serrat, Diputacion 295, Barcelona, Spain
Filed Apr. 15, 1971, Ser. No. 134,193
Claims priority, application Spain, Mar. 6, 1971, UM 166,701
Int. Cl. A45d *1/12*
U.S. Cl. 132—9 6 Claims



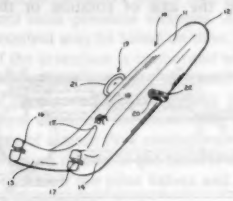
A device for the helicoidal curling or uncurling of natural and artificial fibers especially hair including a tubular body of heat conducting material with at least one helicoidal rib integral therewith and extending from one end of said to the other end thereof, for directing the fibers along said body when placed thereon so as to acquire permanent coils in the fibers when said body as heated, or cause the fibers to loose then initial curl and acquire another form, and pins capable of being positioned around said body to place pressure on said fiber coils.

3,747,611
DENTAL FLOSS DISPENSER
William E. Bennington, 5 Fillmore Dr., Sarasota, Fla.
Filed Sept. 14, 1971, Ser. No. 180,344
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 9 Claims



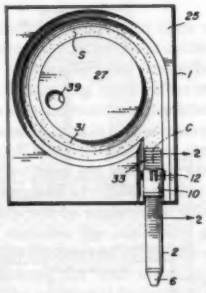
This invention relates to a dental floss dispenser comprising an elongated finger section and a dental floss spool holding section. Dental floss on a spool is easily threaded from the spool section to the end of the finger section through an open slot on the side and through open slots in the finger of the dispenser. Turning of the spool to withdraw floss is controlled by a pin which engages a notch on the spool. Push button means on the side of the dispenser release the spool from the pin to permit the spool to turn.

3,747,612
DENTAL INSTRUMENT
Donald E. Davis, 2115 Cowper Dr., Raleigh, N.C.
Filed Feb. 11, 1972, Ser. No. 225,529
Int. Cl. A61c 15/00
U.S. Cl. 132—92 R 1 Claim



In abstract, a preferred embodiment of this invention is a handle for manipulating dental floss in the form of a pair of prongs joined into a single handle. The prongs are adapted to be placed on opposite sides of the user's teeth to aid in the flossing thereof.

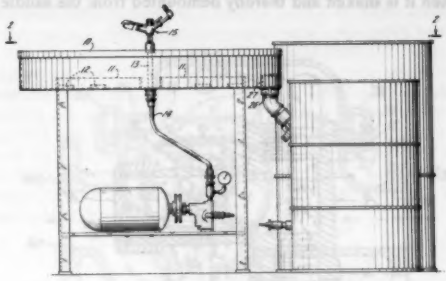
3,747,613
GAME APPARATUS UTILIZING INDEPENDENTLY MOVABLE PIECES
Allen L. Westburg, 3239 Oak Dr., and Joseph G. Lauff, 2437 Boyd Rd., both of Huntingdon Valley, Pa.
Filed July 28, 1971, Ser. No. 166,857
Int. Cl. A63f 9/00
U.S. Cl. 133—1 7 Claims



This invention relates to means for storing and manipulating counters such as are used in playing games in which individual counters are deposited successively on a game board or other surface, the apparatus including means for aligning in serried array a plurality of the counters after they have been randomly deposited therein and for facilitating their introduction to a dispenser from which they may be deposited individually on a game board or the like as has been mentioned, the invention contemplating not only the combination of the apparatus with the counters but also the counter manipulating components of the apparatus as mutually independent inventions.

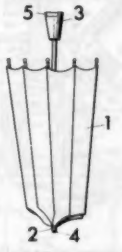
3,747,614
WASHING DEVICE
Robert Buedingen, Seminole, Fla., assignor to Inmount Corporation, New York, N.Y.
Filed Oct. 26, 1971, Ser. No. 192,105
Int. Cl. B08b 3/02
U.S. Cl. 134—109 8 Claims

A washing device for open ended containers such as tubs and drums which are generally used for inks, coatings and the like, is disclosed. The device comprises a rotating impact type sprinkler which applies solvent or cleaning fluid to the inside



of the container while the container is supported in an inverted position.

3,747,615
DEVICE FOR HOLDING AN UMBRELLA IN ITS STANDING POSITION
Kenzo Wakabayashi, Tokyo, Japan, assignor to Wakabayashi & Co., Ltd., Tokyo, Japan
Filed Oct. 20, 1971, Ser. No. 190,988
Claims priority, application Japan, Oct. 21, 1970, 45/103872
Int. Cl. A45b 9/04
U.S. Cl. 135—20 R 6 Claims

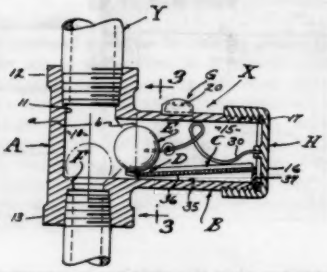


A ferrule of an umbrella has a reduced projecting portion at its tip end. Fitted to the projecting portion is a rubber ring which is bonded thereto. The rubber ring serves to effectively prevent the umbrella from slipping and falling down on a floor when the umbrella is rested against a wall.

3,747,616
EARTHQUAKE SENSITIVE SHUT-OFF VALVE
Hershall E. Lloyd, 4255 N. Tyler, El Monte, Calif.
Filed Nov. 15, 1971, Ser. No. 198,733
Int. Cl. F16k 17/36
U.S. Cl. 137—38 5 Claims

A normally open shut-off valve unit that responds to vibrations of disaster magnitude, to close a fluid line, and which involves a single moving part in the form of a valve element that is manually set for normal open operation, the valve unit involving a leveled valve body with a lateral housing, an inclined bar having a saddle formed of related inclined planes upon which the valve element is normally mounted with point con-

tact out of the flow passage through the unit, there being a seat in said flow passage to receive and support the valve element when it is shaken and thereby demounted from the saddle to



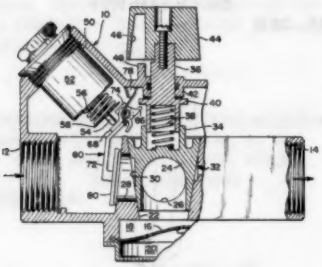
close the said flow passage. Retractile remounting means operates through the seat to reposition the valve element on the saddle.

3,747,617

DUAL LEVER MECHANISMS AND METHOD OF CALIBRATION THEREOF

Jay R. Katchka, Long Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 14, 1971, Ser. No. 162,556
Int. Cl. F23d *13/46*
U.S. Cl. 137—66 **3 Claims**



Dual lever mechanisms especially well suited for use in a combination control device for gas burner apparatus having a reset operator, an electromagnetic holding device and a safety valve member, the dual lever mechanisms including a first lever having one arm actuated by the reset operator, a second arm engaging the magnet armature and a third arm spaced from the second arm and movable into engagement with a second lever for the safety valve member and pivoted in common with the first lever; lost motion is provided between the first and second levers such that the second lever is not engaged by the third arm of the first lever until the final movement of the reset operator whereupon the valve member is lifted from its seat a slight amount thereby permitting the pressure differential experienced across the valve to be balanced. A torsion spring for the second lever thereafter moves the second lever so as to fully open the safety valve.

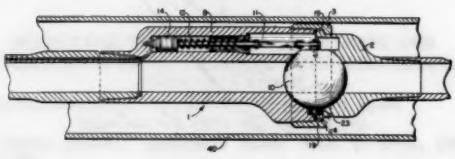
3,747,618

AUTOMATIC SHUT-OFF VALVE SYSTEM

Roger T. Boes, 3713 Bixler St., Metairie, La.

Filed Aug. 13, 1971, Ser. No. 171,475
Int. Cl. F16k *17/38*
U.S. Cl. 137—80 **6 Claims**

An automatic shut-off valve system for oil wells and the like including an in-line positive shut-off valve located aft of a well head in line with the main pipeline to a hydrocarbon reservoir within the earth, equipped with various sensing devices such that any dangerous environment existing in the general area of the well head will effectuate a complete and positive shut-off of the hydrocarbon flow; the shut-off valve is of the ball-type and is pneumatically actuated by means of a spring-biased cylinder, piston and rod assembly disposed at a right angle to and off-set from the axis of rotation of the rotating ball



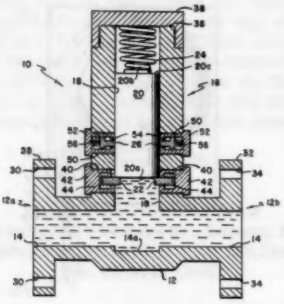
member and connected thereto by means of a bell crank assembly; when the line is to be closed a pneumatic pressure is introduced into the cylinder, propelling the piston and rod toward the ball element and by means of the bell crank assembly rotating it ninety degrees; the system includes an auxillary pneumatic system for reopening or unjamming the valve; the edge or lip of the ball serves as a cutting edge to sever any cables or wires in the pipeline.

3,747,619

SEAL-OFF VALVE

George A. Wacker, 12507 Windover Turn, Bowie, Md., and George J. Danek, Jr., 1021 Harbor Dr., R.F.D. 3, Annapolis, Md.

Filed Dec. 23, 1971, Ser. No. 211,234
Int. Cl. F16k *17/38*
U.S. Cl. 137—80 **9 Claims**



A seal-off valve has a valve body with first and second portions. The first portion forms a passageway to permit the flow of fluid therethrough and the second portion integratedly forms a cavity with the passageway. A flow obstructing means is retained in a first position substantially within the cavity by temperature reponsive retention means which, upon actuation in response to a substantial temperature change, permits the flow obstructing means to be urged to a second position substantially within the passageway.

3,747,620

IRRIGATION SPRINKLER SYSTEM CONTROL EMPLOYING PILOT OPERATED, PRESSURE ACTUATED AND SEQUENCED VALVE ASSEMBLIES

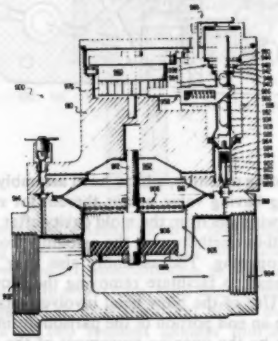
Carl L. C. Kah, Jr., 778 Lakeside Drive, North Palm Beach, Fla.

Continuation of Ser. No. 90,732, Nov. 18, 1970, abandoned. This application Feb. 1, 1972, Ser. No. 222,600
Int. Cl. G05d *11/00*; A01g *25/02*; F17d *3/00*
U.S. Cl. 137—119 **87 Claims**

The disclosure introduces a number of new concepts in the operation and control of pressure actuated and sequenced

valve assemblies which include pressure cycling, selective reset, tracking of sprinkler section operation and cyclic pressure level control. Each of the pressure actuated and sequenced valve assemblies herein disclosed includes pressure cycling and/or reset capabilities operable as a direct function of line pressure changes and as an indirect function of a remote electrical control system which may be selectively employed to control such pressure changes. Alternatively, the direct function control may be based on time.

One aspect of the invention is concerned with the constructional details of various pressure actuated and sequenced valve assembly configurations employing pilot valves and sequencing control elements for controlling the opening and closing movement of a main flow control valve while a second aspect of the invention relates to the control of those line pressure variations to which the pilot valves and sequencing control elements are responsive.



The sequencing control elements in each of the line connected valve assemblies may be pressure cycled without opening the main valve by varying inlet line pressure at a level below that required to open the main valves and the sequencing control elements may be reset to a predetermined position by a further selective reduction in line pressure level.

The remote electrical control system has a primary function of insuring that each cyclic line pressure change is of such magnitude and/or duration as to insure that each line connected valve assembly will be sequenced. The electrical control system further includes the capability of an automatic selection of a manually chosen one of the plurality of line connected sprinkler sections for individual and/or prolonged sprinkling as well as the additional features of pressure cycling and reset of all the line connected sequencing control elements which latter two functions may also be performed by a conventional hydraulic control adjacent the line pressure source when valve assemblies of the type herein disclosed, possessing these capabilities, are used.

3,747,621

BACKFLOW PREVENTER

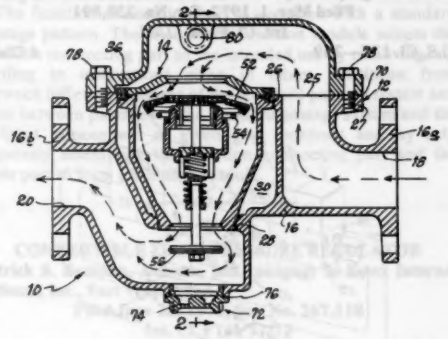
Sebastian David Tine, Lawrence, Mass., assignor to Watts Regulator Company, Lawrence, Mass.

Continuation-in-part of Ser. No. 78,057, Oct. 5, 1970, Pat. No. 3,636,968. This application Nov. 2, 1971, Ser. No. 194,880

Int. Cl. F16k *17/04*

U.S. Cl. 137—218 **8 Claims**

An in line assemblage of a cross-connection control valve that permits ready removal or insertion of a cross-connection control valve in a cartridge-like manner is achieved by providing a control valve module that includes a valved inlet and outlet and a venting port, and by providing an in line housing having a body shaped and arranged to receive therein in operative association the control valve module. The in line housing includes a removable cover which cooperates with the module



to prevent dislocation of the module within the housing body, but when removed permits of rapid removal and accurate insertion of a module into the housing body.

3,747,622

APPARATUS FOR DIVIDING UP A MASS OF SMALL PARTICLES INTO PART STREAMS

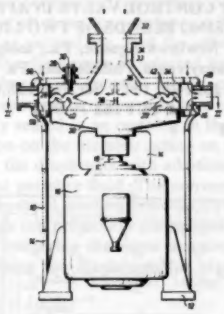
Rolf Bertil Reinhall, Killingevagen 16, Lidingo, Sweden

Filed Jan. 3, 1972, Ser. No. 215,013

Claims priority, application Sweden, Jan. 20, 1971, 668/71

Int. Cl. G01n *1/18*

U.S. Cl. 137—262 **5 Claims**



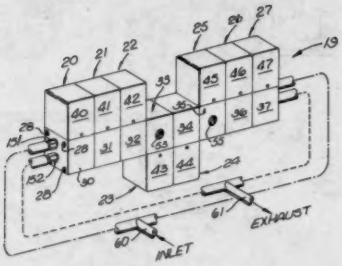
An apparatus for subdividing a mass of small particles into a plurality of sub streams of relatively variable size comprising two disc-shaped members which between them define an interspace, and at least one of which rotates at high speed. The mass of particles is introduced at the centrum of the interspace and slung outwardly by centrifugal force into the interspace with substantially uniform peripheral distribution about the circumference of the disc-shaped members and into a circumferential annular chamber which is subdivided into sections by means of peripherally displaceable collecting shields; the length of the arc shaped sections being adjustable relative to one another determine the relative magnitude of the sub stream caught in each section by its associated shield which stream is discharged through an opening formed in the circular outer wall of the respective section.

3,747,623

FLUID FLOW CONTROL MANIFOLDS AND DEVICES

Roger Greenwood, Valencia, and Leo William Van Bellen, Burbank, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 1, 1972, Ser. No. 230,891
Int. Cl. F16k 11/02
U.S. Cl. 137—269 4 Claims



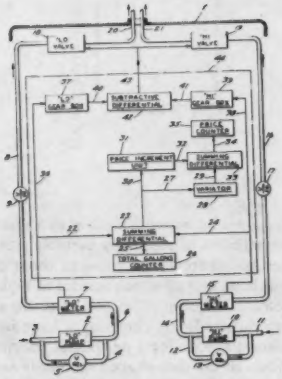
A valve manifold and a modular valve which may be used in the assembly thereof or used separately therefrom. When the valve is mounted in any one of four positions, four different combinations of functions are possible. No additional parts are required to mount the valve in any of the four positions. All valves may be identical or some may be normally open and some normally closed. Half O-ring grooves permit the use of two positions. Mounting symmetry is required in any case. Two seals permit either pneumatic or hydraulic use. Tandem operation of two valves with a single solenoid is accomplished through the use of rods slidable through the valve body. Higher pressure ratings may be achieved in alternative embodiments.

3,747,624

OPERATION OF CONTROL VALVE IN APPARATUS FOR DISPENSING BLENDS OF TWO LIQUIDS

Einar T. Young, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 29, 1971, Ser. No. 158,020
Int. Cl. F16k 19/00
U.S. Cl. 137—100 11 Claims



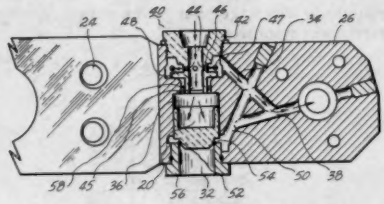
In apparatus for dispensing any selected one of a plurality of blends of liquid motor fuels of different octane ratings or numbers, or in the alternative either motor fuel alone, a dual control valve is used to govern the flow of the two fuels to the dispensing nozzle. Each time any one of the blends is manually selected for dispensing, the dual control valve is automatically adjusted (by means of a biasing arrangement) to open wide the higher octane fuel portion of the dual valve and to close completely the lower octane fuel portion of the dual valve.

3,747,625

METHOD AND APPARATUS FOR VENTING AND RELEASING PLASTIC ARTICLES FROM A BLOW MOLD

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 802,539, Feb. 26, 1969, Pat. No. 3,640,671. This application Nov. 27, 1970, Ser. No. 93,338
Int. Cl. B29c 17/07
U.S. Cl. 137—102 3 Claims



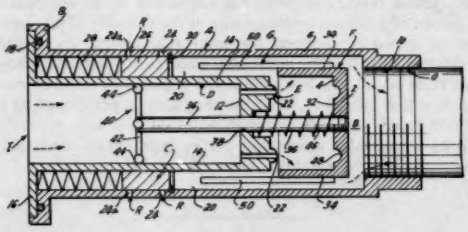
In a blow molding machine, a blow head assembly which includes a housing having valve means therein for rapidly exhausting the blowing gas from the mold cavity after formation of the article without withdrawing the assembly from registry with the mold opening. The assembly also may include a recessed blow head to facilitate removing the blown article from the mold. Use of the blow head involves establishing a seal therein with an end portion of the parison during blowing which is broken by the opening movement of the mold sections to permit the article to fall cleanly away from the mold.

3,747,626

COMBINED CHECK AND RELIEF VALVE

Joseph V. Valentino, 1120 Jensen Ave., Mamaroneck, N.Y.

Filed May 5, 1971, Ser. No. 140,463
Int. Cl. F16k 15/18
U.S. Cl. 137—102 20 Claims



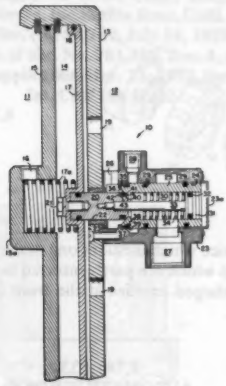
A valve structure functions as a check valve, permitting flow of fluid therethrough only in one direction, and as a relief valve, permitting pressure to be vented when it exceeds a given value. The valve is provided with inlet, outlet and relief ports. Valve actuating means is exposed to the inlet and outlet pressures and is variably positioned in accordance with the changing differential between those pressures in order to permit fluid flow from inlet to outlet but not in the opposite direction. If the outlet pressure exceeds a predetermined value that actuating means is moved to a position in which the normally closed relief port is opened, thereby to vent the excess pressure.

3,747,627

PRESSURE REGULATOR AND COMPENSATOR

Sidney A. Christie, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 8, 1972, Ser. No. 260,931
Int. Cl. F16k 31/365; G05d 7/00, 16/14
U.S. Cl. 137—102 7 Claims



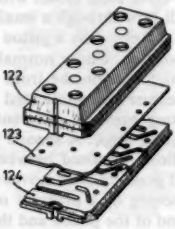
A pressure compensator includes two reciprocally displacable sealing assemblies for allowing the exchange of fluid to permit overpressure compensation as well as underpressure compensation. In either case, rigid annular mating sealing surfaces cooperate to bear the brunt of the sealing load while either one of two resilient annular four-lobed seals bear against a continuation of the opposed rigid sealing surface to effect the primary sealing. Having the serially arranged heavy-duty rigid sealing surfaces and the resilient four-lobed seal renders the pressure compensator well suited for pressure regulation of gases and permits its interconnection to a source of high-pressure gas without the danger of failure.

3,747,628

FLUIDIC FUNCTION MODULE FOR USE IN A SYSTEM FOR CONSTRUCTING FLUIDIC CIRCUITS

Peter Leendert Holster, and Hendricus Franciscus Gerardus Smulders, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1972, Ser. No. 222,476
Claims priority, application Netherlands, Feb. 17, 1971, 7102074
Int. Cl. F15c 3/04, 5/00
U.S. Cl. 137—269 4 Claims



A fluidic function module for constructing fluidic logical and/or analog circuit and which comprises a basic part including a plurality of fluidic circuit elements and a function connecting part which is arranged in contact with the basic part and in which passages have been formed which appropriately interconnect the input, output, supply and zero-pressure passages of the individual circuit elements, thus making the function module suitable for use as, for example, an AND, an OR, a universal or a storage module or as a function module having another desired function.

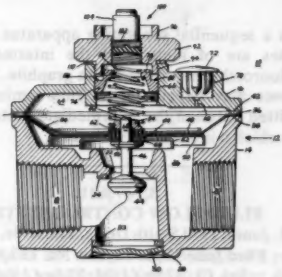
The function connecting part is provided with a standard passage pattern. The user of the function module adapts the function connecting part to the intended use by removing, according to instructions given in tables, partitions from between different passages of the standard passage system and from between passages of the standard passage system and the ambient atmosphere at given grid locations and by subsequently assembling the function connecting part and the basic part to form a function module.

3,747,629

CONVERTIBLE FLUID PRESSURE REGULATOR

Patrick S. Bauman, Auburn, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed June 28, 1972, Ser. No. 267,118
Int. Cl. F16k 31/12
U.S. Cl. 137—270 10 Claims



A convertible fluid pressure regulator employing a flexible diaphragm valve operator and two springs, one of which biases the diaphragm at all times for regulating a fluid having a first pressure, such as natural gas, and the other of which additionally biases the diaphragm at selected times for regulating another fluid having a second, higher pressure, such as liquefied petroleum gas. A conversion member has a first position removeably seated in an opening in the regulator casing with a projection on the member acting on the second spring thereby to bias the diaphragm with additional force for regulating the higher pressure fluid. The conversion member also has a second, reversed position removeably seated in the casing opening with the projection disengaged from the second spring thereby rendering the same inactive so that the first spring alone biases the diaphragm for regulating the lower pressure fluid.

3,747,630

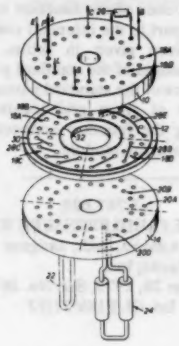
PLATE VALVES

Ronald Arthur Hurrell, Farley House, Crowborough Hill, Crowborough, England

Filed May 20, 1971, Ser. No. 145,376
Claims priority, application Great Britain, May 20, 1970, 24,470/70
Int. Cl. F16k 3/08
U.S. Cl. 137—312 10 Claims

A plate valve which can be programmed to effect a prescribed sequence or cycle of fluid switching operations as a movable member is advanced or rotated. An intermediate, "-programme", plate, is mounted between two outer plates for movement with one of them with respect to the other and adjacent faces of the three plates are in fluid-tight sealing engagement. The plates are formed with registering sets of through holes and external fluid flow connections are made to the openings in the outer plates, any hole in either outer plate

to which no connection is required to be made in accordance with the prescribed programme being closed off. The intermediate plate is grooved on one or both of its faces to provide connections between holes as required in accordance with the prescribed programme. This type of valve may be incor-

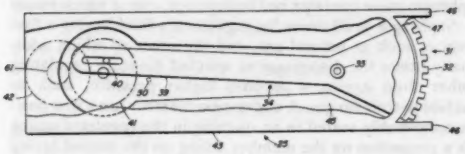


porated in a sequential separating apparatus. Preferably the outer plates are of metal and the intermediate plate of polytetrafluoroethylene loaded with graphite. The "programme" grooves may be cut into a thin laminate of suitable material fitted between the intermediate plate and the outer plate with which it is mounted to move.

3,747,631
FLUID FLOW CONTROL SYSTEM

William M. Jones, 1940 Smith Drive, Titusville, Fla.

Filed June 17, 1971, Ser. No. 153,968
Int. Cl. B23b *41/08*; F16e *41/04*
U.S. Cl. 137—318 10 Claims



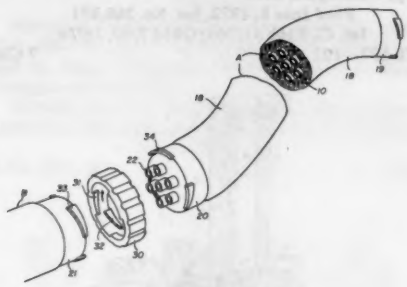
A fluid flow control system is provided for restricting or stopping the flow of pressurized fluids in a pipeline. This system, for example, can be installed in a pipeline which is carrying oil, and can be utilized to control such fluid, during oil well fires and in pipe lines which have been ruptured. This system includes a saddle clamp for encompassing the pipeline to seal off a portion thereof, a mechanism for cutting a port in the pipeline, and a valve device for insertion into the port to control the flow of fluid in the pipeline.

3,747,632
FLUID CONDUITS

Albertus Jacobus Theodorus Kok, Nyon, and Arnold Bronnimann, Petit-Lancy, both of Switzerland, assignors to IPP Industrial Polymer Processing S.A., Geneva, Switzerland

Filed Mar. 10, 1971, Ser. No. 122,690
Claims priority, application Switzerland, Mar. 13, 1970, 3763/70
Int. Cl. F16l *9/18, 39/00*
U.S. Cl. 137—375 19 Claims

The invention provides firstly a multi-tube conduit sheathed in synthetic resin foam, the surface of the foam providing the outer surface of the conduit; secondly a method of making the conduit involving the use of two coupling plates, with which the conduit ends are preferably provided, to define the ends of a forming head into which a molten mixture of synthetic resin and foaming agent is extruded to form the sheath, the tubes being secured at one end in holes formed in one plate and extending slidably through holes in the other plate; and thirdly a

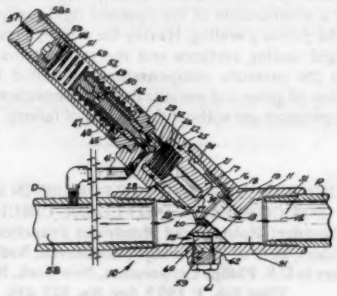


connecting device which includes one of the plates and further includes fittings which are partly inserted in the tube ends and pushed into enlarged cavities at the front or outside ends of the plate holes.

3,747,633
AUTOMATIC CHOKE

Henry U. Garrett, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Aug. 20, 1971, Ser. No. 173,360
Int. Cl. F16k *17/10*
U.S. Cl. 137—489.3 9 Claims



A valving means for automatically restricting the flow of fluids through a flow conductor until undesirably high pressures occurring in the upstream end of the conductor return to normal. A primary valve stem closes with the advent of high pressure to force all flow through a small orifice choke. The primary valve stem is formed by a piston and is spring biased toward its seated position. Under normal conditions, the upstream pressure which acts on the front end of the piston is greater than the pressure communicated to the piston's back end and the resulting pressure differential holds the valve open against the spring force. A second pressure differential acting across a bellows disposed between the piston's back end and an external pressure area moves a control valve stem which regulates opening of a pressure outlet line extending between the back end of the piston and the downstream pressure area. When the pressure outlet line closes, a pressure inlet line extending between the upstream pressure area and the piston's back end permits pressure at the latter location to increase until it equals the upstream pressure which then permits the spring to drive the piston against the valve seat to close the primary valve opening. The small choke orifice is included as a part of a removable insert so that it may be replaced without disassembly of the entire valve. Incompressi-

ble fluid is trapped within the area confined by the bellows when bellows foreshortening exceeds a predetermined amount to prevent further foreshortening which might otherwise cause bellows damage.

3,747,634

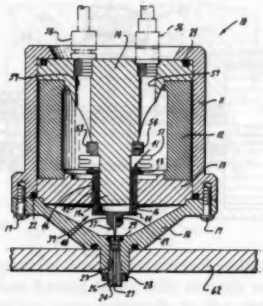
SERVO SYSTEM WITH ELECTRICALLY OPERATED VALVE FOR MAINTAINING A CONSTANT PRESSURE

Eugene A. Eufusia, Santa Rosa, Calif., assignor to Optical Coating Laboratories, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 54,730, July 14, 1970, abandoned, which is a division of Ser. No. 781,150, Dec. 4, 1968, Pat. No. 3,596,873. This application Mar. 23, 1972, Ser. No. 237,495

Int. Cl. F16k *31/02*

U.S. Cl. 137—487.5 **3 Claims**



A servo system with electrically operated valve for maintaining a constant pressure in a chamber in which the valve is mounted on the chamber to precisely control the rate of flow into the chamber and having monitoring means adapted to be mounted on the chamber for monitoring the pressure in the chamber. An error amplifier is provided for comparing the monitor pressure with the reference and supplies an error signal to the electrically operated valve to change the rate of metering of fluid into the chamber.

3,747,635

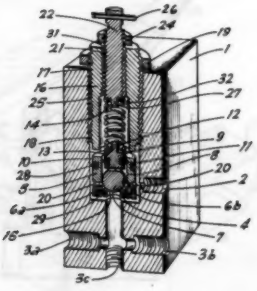
PRESSURE RELIEF CONTROL VALVE

Frank Garamy, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 25, 1972, Ser. No. 256,741

Int. Cl. F16k *15/04*

U.S. Cl. 137—539.5 **2 Claims**



A pressure control relief valve to regulate the pressure in a fluid conduit disposed between a high pressure source and a low pressure receiving device including a valve body having a fluid inlet and a fluid outlet with a slidably mounted valve means disposed within the valve body between the fluid inlet and the fluid outlet, the slidably mounted valve means being operable in relation to the pressure applied by an adjusting means on one side and the pressure of the fluid passing into the body from the fluid inlet on the opposite side, the setting of the adjusting means being such that the fluid will not pass through the valve unless it exceeds the preset pressure exerted on the slidable valve means by the adjusting means.

3,747,636

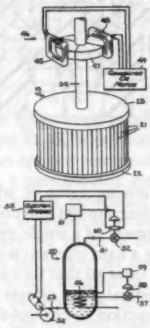
CONTROL VALVE AND PROCESS CONTROL SYSTEM

Joseph O'Connor, Jr., Goshen, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Division of Ser. No. 112,890, Feb. 5, 1971, Pat. No. 3,709,245. This application Sept. 25, 1972, Ser. No. 291,904

Int. Cl. F15b *5/00*

U.S. Cl. 137—561 **1 Claim**



The control valve has a stator which imparts a swirl to the flow of fluid and a rotor which is rotated under the swirl of fluid. Energy is absorbed from the rotor in various ways. In one instance, the rotation of the rotor is subjected to a drag force which is induced in opposition to the force of rotation in order to control the pressure drop in the flow. In another instance, the rotation of the rotor is used to store electrical energy which can be used for other purposes throughout the process system.

3,747,637

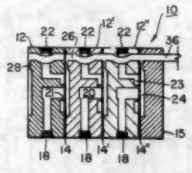
PRESSURE-OPERATED MULTIPORT FLUID CONTROL VALVE

John C. Mollere, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Sept. 27, 1971, Ser. No. 183,902

Int. Cl. F16k *11/10*

U.S. Cl. 137—594 **4 Claims**



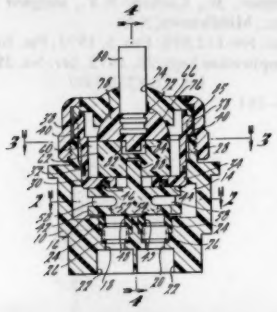
A pressure-operated, multiple-unit, diaphragm-valve is disclosed. Application or release of pilot-pressure to the valve actuates all of several diaphragm elements simultaneously thereby providing substantially instantaneous shutoff of fluid flow through a plurality of pipe lines. Other important features of the valve are its structural simplicity, speed of operation, and its modular construction.

3,747,638

SINGLE HANDLE MIXING VALVE

Alex Manoogian, Grosse Pointe Farms, and Eric V. Pullen, Northville, both of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed Aug. 25, 1971, Ser. No. 174,665
Int. Cl. F16k 11/00
U.S. Cl. 137—625.4 **7 Claims**



A single handle mixing valve in which a disc type valve member is slidable over the hot and cold water inlet ports in a valve body by movement of a single operating handle. A control means including a cam element is interposed between the handle and the disc valve so that forward and back movement of the handle in a vertical plane effects linear movement of the disc valve in one direction to control the volume of flow, and rotation of the handle on its axis effects linear movement of the disc valve in a perpendicular direction to control the mixture of the two liquids.

ERRATUM

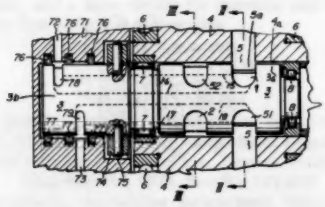
For Class 137—625.64 see:
Patent No. 3,747,570

3,747,639

BALANCING ARRANGEMENT FOR A CONTROL BODY HAVING PORTS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Filed Nov. 17, 1970, Ser. No. 90,410
Claims priority, application Austria, Nov. 24, 1969, A 10964
Int. Cl. F16k 11/06, 39/04
U.S. Cl. 137—625.24 **14 Claims**



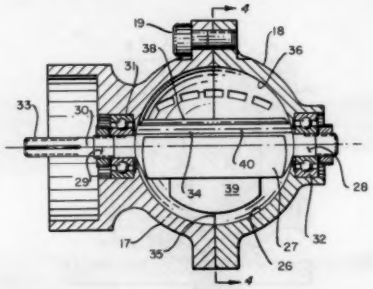
A control body in a rotor of a fluid handling device, has at least one pair of diametrically opposite high and low pressure control ports cooperating with ports in the rotor which communicate with working chambers. In order to center the control body in the rotor, only one high pressure balancing chamber is axially aligned with the low pressure control port, and only one low pressure balancing chamber is axially aligned with the high pressure control port. Only one balancing recess cooperates with each control port and is diametrically, and also in axial direction, spaced from the same whereby the control body is not bent by the pressure forces, and leakage is reduced.

3,747,640

CONTROL VALVE

Jerome A. Carlson, Mercer Island, Wash., assignor to Bearings, Seals & Gears, Inc., Redwood City, Calif.

Continuation of Ser. No. 803,756, March 3, 1969, abandoned. This application Feb. 23, 1971, Ser. No. 118,091
Int. Cl. F16k 1/22
U.S. Cl. 137—625.21 **7 Claims**



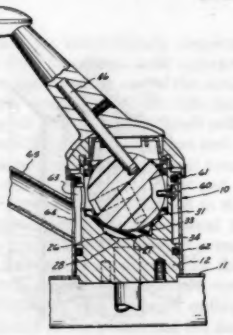
A control valve is disclosed with a plurality of outlets receiving fluid from a curved chamber filled from a single inlet. A seal equipped valve closure member is pivotally mounted in the chamber to connect selected outlets to the inlet or to vent the outlets to the atmosphere.

3,747,641

SINGLE HANDLE FAUCET VALVE

Terence G. Hare, 22600 Middlebelt G-11, Farmington, Mich., and Hugh McCormick, 30 Brookline Ln., Dearborn, Mich.

Continuation-in-part of Ser. No. 844,869, July 25, 1969, Pat. No. 3,623,510. This application Nov. 23, 1971, Ser. No. 201,347
Int. Cl. F16k 11/00
U.S. Cl. 137—625.41 **19 Claims**



The single handle faucet disclosed herein comprises a faucet body which has a pair of inlets for hot and cold water and a liquid outlet. A spherical valve body is mounted for swinging movement within the body and has a spherical surface that is complementary to a similar compressible spherical surface on the faucet body. The valve body has passages extending from

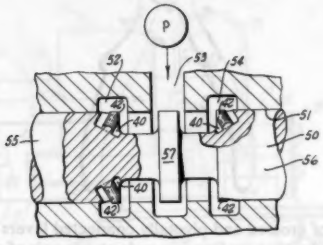
the spherical surface of the valve body. The passages of the valve body and the passages of the faucet body are adapted to be selectively aligned.

3,747,642

THROTTLE NOTCHES FOR CONTROL VALVE SPOOLS

William N. Tolbert, Jr., Pewaukee, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Oct. 26, 1971, Ser. No. 192,179
Int. Cl. F16k 1/00, 11/07
U.S. Cl. 137—625.69 10 Claims



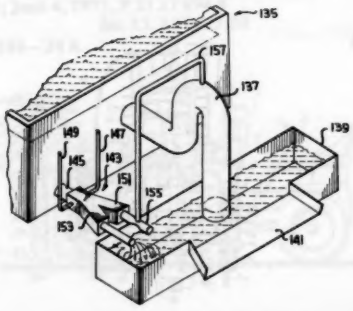
A control spool for directional control and/or pressure compensating valves having lands with throttle notches in their ends. The notches open outwardly to the periphery of their lands and axially to adjacent circumferential grooves in the spool. A post fixed in the bottom of each notch projects outwardly therefrom, away from the spool axis, in spaced relation to the side wall of the notch. The post can be cylindrical, and it can also be tilted to dispose its inner end a greater distance from the end of the land than its outer end. The side wall of the notch is concentric to the post.

3,747,643

FLUIDICALLY CONTROLLED SIPHON

Peter A. Freeman, Baltimore, Md., assignor to Bowles Engineering Corporation, Silver Spring, Md.

Division of Ser. No. 842,599, July 19, 1969, Pat. No. 3,675,672. This application Feb. 18, 1972, Ser. No. 227,434
Int. Cl. F15c 1/04; B05b 9/02; E01h 3/02
U.S. Cl. 137—806 10 Claims



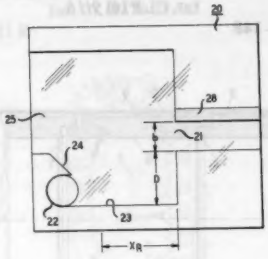
A fluidic control for a siphon employs venturi action in a fluidic element to create a suction force at the neck of the siphon to initiate siphon flow. The siphon arrangement is disclosed in various liquid flow control embodiments.

3,747,644

ELECTRIC TO FLUIDIC TRANSDUCER

David Elliott Tompsett, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1971, Ser. No. 189,631
Int. Cl. F15c 3/00
U.S. Cl. 137—825 5 Claims



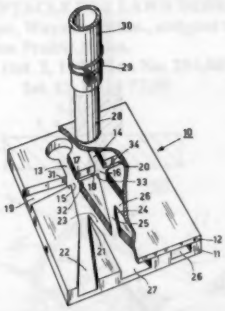
A fluid logic element is disclosed in which the point of attachment of a power jet to an offset wall is selectively controlled in response to an applied electrical signal. The electrical signal is applied to a piezoelectric element positioned to form a side wall of the nozzle generating the power jet. The bending of the element in response to the applied electrical signal selectively reduces the width of the nozzle. Since the point of attachment of the power jet to the offset wall is a function of the nozzle width, controlling the nozzle width by selectively positioning the element permits the attachment point to be controlled. The resulting logic device has outputs which are energized in response to the particular attachment point selected.

3,747,645

FLUID CONTROL DEVICE

Peter Leendert Holster; Hendricus Franciscus Gerardus Smulders, both of Emmasingel, Eindhoven, Netherlands, and Roger Bertrand Baert, Halifax, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,150
Claims priority, application Netherlands, Nov. 17, 1970, 7016798
Int. Cl. F15c 1/12
U.S. Cl. 137—838 6 Claims

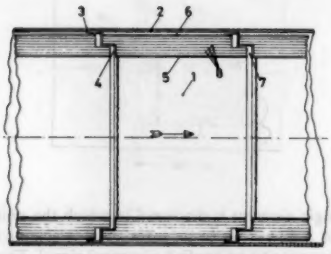


A machine for washing textile fabrics, dishes or the like has a number of supply containers for detergents or additives, and is provided with a fluid control device for flushing the supply containers. A number of parallel-connected branches of a water conduit are provided which open into the fluid control device. The number of the branches is smaller than the number of supply containers. The fluid control device comprises a distributing member having at least one fluid wall attachment element.

3,747,646
INSULATION OF GAS FEED TUBES

Flaviano Farfaletti-Casali, Milan, Italy, assignor to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed Mar. 29, 1971, Ser. No. 128,685
Claims priority, application Italy, Apr. 22, 1970, 50150 A/70
Int. Cl. F16l 9/18
U.S. Cl. 138—148 11 Claims

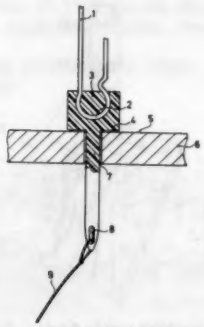


A heat insulation system for gas conduits in which open cylinders are placed side by side coaxially within the conduit. Each cylinder has an inner and outer wall, the gap between the walls being occupied by concentric metal layers which are so shaped and stacked that a number of longitudinal gaps are provided between any two metal layers. The gap is closed either at the upstream end of the cylinder or in the central zone.

3,747,647
MOUNTING FOR THE VERTICAL HOOK OF A JACQUARD MECHANISM

Gerhard Bergmann, 6055 Hausen b. Offenbach/M., Germany

Filed Mar. 3, 1972, Ser. No. 231,571
Claims priority, application Germany, Mar. 4, 1971, P 71 08 172.6
Int. Cl. D03d 3/14
U.S. Cl. 139—59 5 Claims

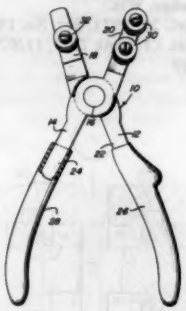


A plastic mount wherein the spring-like bent end of a vertical hook of a jacquard mechanism is embedded for mounting the vertical hook on a mounting board. The harness cord is attached to the mount.

3,747,648
WIRE SHAPING TOOL

Gerald H. Bauer, 2885 Kietzke Ln., Spce No. 26, Reno, Nev.

Filed Sept. 28, 1971, Ser. No. 184,528
Int. Cl. B21f 1/02
U.S. Cl. 140—147 10 Claims

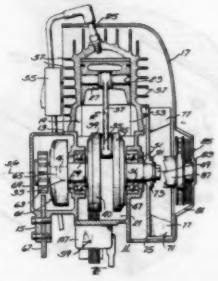


A pair of crossed and pivotally connected levers defining a first pair of corresponding jaw ends at one pair of ends and a second pair of corresponding handle ends at the other pair of ends. One of the jaw ends includes a pair of aligned rollers spaced longitudinally thereof and journalled on one side thereof about parallel axes extending transversely of the one jaw end. The otherjaw end includes a third roller journalled therefrom about a third axis extending transversely of the other jaw end and disposed in a plane generally centrally intermediate the axes of rotation of the first pair of rollers and normal to a line extending between the first pair of rollers. The peripheries of the rollers are grooved to embracingly receive a wire to be straightened therebetween and the handle ends of the levers may have manual pressure applied thereto in order to urge the jaws together and to clamp a length of wire to be straightened between the first pair of rollers and the third roller as the levers are moved along the length of wire to be straightened.

3,747,649
CRANKSHAFT MAGNETO SYSTEM

Ulrich O. Densow, and Lloyd A. Simmons, both of Peterborough, Ontario, Canada, assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 8, 1971, Ser. No. 113,322
Int. Cl. B27b 17/00; F02p 3/06
U.S. Cl. 30—381 8 Claims



Disclosed herein is a chain saw including a breakerless ignition system electrically coupled to a spark plug and including at least one component mounted on the crank cheek of a crankshaft and other components mounted on a crankcase in close proximity to the path of the crank cheek, together with a fan mounted on one crankshaft end portion, a chain sprocket

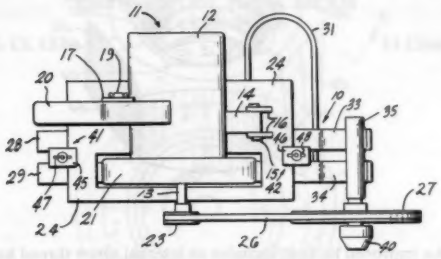
and clutch assembly driven by the other of the crankshaft end portions, and a starter mounted on the chain saw frame and including a clutch having a component mounted on the fan and another component mounted for travel to engage the clutch for starting of the engine.

3,747,650

AUXILIARY TOOL ADAPTER FOR ELECTRIC HAND SAWS

Clarence J. Heisler, R.R. No. 2, Springport, Mich.

Filed Jan. 18, 1971, Ser. No. 107,292
Int. Cl. B27c 9/02
U.S. Cl. 144—1 E **8 Claims**



A power tool attachment is provided which is adapted to be attached to a hand-held circular blade power saw, of the type commonly referred to as a "skil-saw." The attachment comprises a base adapted to be clamped to the base of the saw, and a mandrel maintained in a position elevated above the saw base, having a rotatably mounted shaft and pulley affixed thereto. The shaft is driven by means of a flexible endless belt engaging the pulley and operated by a second pulley mounted on the motor shaft and engaged by the belt. Means are provided on the end of the shaft for attachment to various rotatable tools, or to a chuck which may be utilized in engaging the shafts of various types of rotary tools.

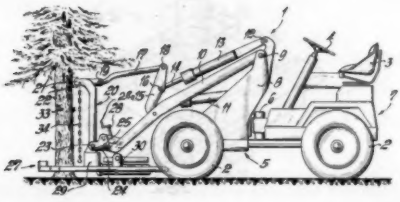
In an alternative embodiment, an integral saw with its base portion including an arbor mounting means having a rotatable shaft is provided for accomplishing the same purposes.

3,747,651

SELF-PROPELLING VEHICLE WITH TREE-FELLING SHEARS

Hans Bangert, and Werner Arenz, both of Sprockhovel, Germany, assignors to Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Filed Apr. 17, 1972, Ser. No. 244,548
Claims priority, application Germany, Apr. 17, 1971, P 21 18 734.8; June 4, 1971, P 21 27 694.8
Int. Cl. A01g 23/08
U.S. Cl. 144—34 A **6 Claims**



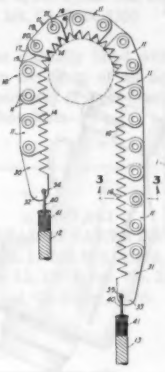
A self-propelled vehicle in which the front portion that is pivotable about a vertical axis relative to the rear portion of the vehicle carries tree felling shears with the cutting edge of the cutting blade extending substantially at a right angle to the driving direction of the vehicle. The housing for the felling shears supports a connecting assembly which pivotally supports a thrust member that is hydraulically pivotable in a plane extending in the longitudinal direction of the vehicle for exerting a pre-load on the tree to be felled.

3,747,652

FLEXIBLE PRUNING SAW

Charles D. Meadows, 6059 Kayron Drive, N. E., Atlanta, Ga.

Filed Jan. 3, 1972, Ser. No. 214,844
Int. Cl. B27b 21/00
U.S. Cl. 145—31 R **5 Claims**



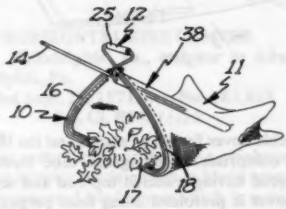
A saw for use in cutting limbs from a standing tree, wherein the saw is constructed of a plurality of blade elements pivotally attached to each other in serial fashion to form an elongated flexible saw means. Each blade element includes a plurality of cutting teeth, with the blade elements being connected to each other so that the first cutting tooth of adjacent pivotally connected blade elements overlap each other. Elongated rope means are attached to opposite ends of the flexible saw means whereby the flexible saw means can be reciprocated around a limb to cause the cutting teeth to sever the limb from the standing tree. The flexible saw means is propelled into position over a limb of a standing tree by attaching a weight means to an elongated flexible rope means and by throwing the weight and rope over the limb, thereafter pulling the flexible saw into position around the limb to be cut.

3,747,653

RECEPTACLE FOR LAWN DEBRIS

Charles Judd Ringer, Wayzata, Minn., assignor to Judd Ringer Corporation, Eden Prairie, Minn.

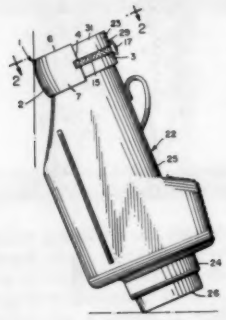
Filed Oct. 2, 1972, Ser. No. 294,089
Int. Cl. B65d 77/00
U.S. Cl. 150—1 **9 Claims**



A self-supporting receptacle for collecting lawn debris in which there is a triangular frame of rod material, a bag secured to said frame with the frame maintaining the opening of the bag extended, and a prop rod movably supported with

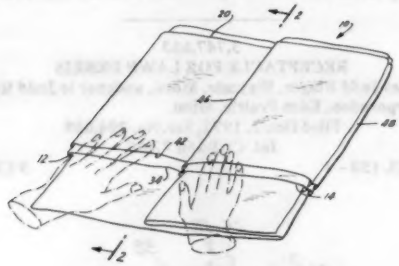
respect to the frame. Specifically, the prop rod is supported in a sleeve of the bag running lengthwise of the bag from adjacent the opening. A handle member is secured to the frame for transporting the receptacle. The frame is sufficiently bendable that the legs of the triangular frame can be bent together for shipping and storage purposes.

3,747,654
PROTECTIVE PADS
Frank Wilson, Box 102, Grayslake, Ill.
Filed Oct. 27, 1971, Ser. No. 193,091
Int. Cl. A63b *55/00*
U.S. Cl. 150—1.5 R **5 Claims**



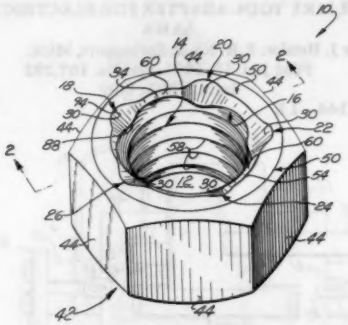
A pad removably mountable on a golf bag for protecting the bag against wear.

3,747,655
DISPOSABLE MAYO STAND COVER
Frederick B. Hadtke, New Providence, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Mar. 19, 1971, Ser. No. 126,148
Int. Cl. B65d *65/02*
U.S. Cl. 150—52 R **4 Claims**



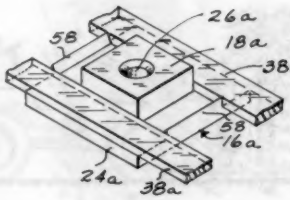
A disposable cover for Mayo stands and the like is provided. The cover comprises an elongated tube formed of a non-woven material having a sealed top end and an open bottom end. The cover is prefolded along lines perpendicular to the longitudinal axis of the tube thereby dividing the tube into a plurality of transverse sections. The sections are telescopically folded within one another with the section that includes the closed top end comprising the centermost section and the edge of the tube defining the open bottom end directed away from the closed top end.

3,747,656
LOCKNUT
Hal J. Mortus, Twinsburg, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio
Filed Dec. 22, 1971, Ser. No. 210,980
Int. Cl. F16b *39/30*
U.S. Cl. 151—21 B **7 Claims**



An improved locknut includes an internal screw thread having an outermost thread convolution with axially offset flank sections which are adapted to interfere with thread convolutions on an externally threaded member to provide a locking action between the nut and the externally threaded member. These axially offset flank sections are formed by a plurality of pressure pads or arcuate indentations which extend axially and radially inwardly from an outer face surface of the nut into the outermost thread convolution. Each of these indentations is formed by a continuously curving and concave surface having a maximum circumferential extent adjacent a line of intersection between the face surface and an opening extending through the nut. The concave surface of the indentation diminishes in circumferential extent in a direction extending radially inwardly from the circular line of intersection between the opening and face surface to form one of the axially offset sections of the outermost thread convolution. The continuously curving concave surface on each of the pressure pads advantageously forms a portion of a cone having its longitudinal axis extending at an acute angle to the longitudinal axis of the opening in the nut body.

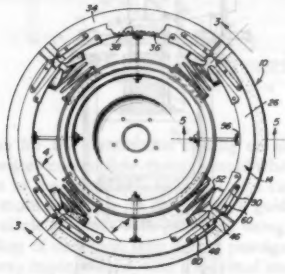
3,747,657
NUT TYPE FASTENER
Francis E. Ryder, Barrington, Ill., assignor to Value Engineered Components, Inc., Streamwood, Ill.
Filed Apr. 23, 1971, Ser. No. 136,722
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.7 **2 Claims**



The present invention relates generally to nut-type fasteners for application to an apertured panel and more particularly to nut-type fasteners which may be adhesively attached to one side of an apertured panel to facilitate subsequent application of a fastener shank thereto. An embodiment of the invention disclosed herein includes an integral nut-body having a first

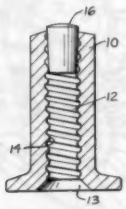
section adapted to be telescopically inserted within a complementary aperture in a panel. Radiating from the base of said section is a second section of greater diameter providing a panel clamping surface. A sealing type adhesive associated with said clamping surface serves to adhere the nut body to the panel surface upon telescopic association of the first section with a complementary panel aperture whereby to position an axial aperture in the body for receiving a fastener shank, as for example the threaded shank of the screw member.

3,747,658
FLEXIBLE SECTIONAL WHEEL
Gordon R. Hall, P.O. Box 496, Listowel, Ontario, Canada
Filed Nov. 2, 1971, Ser. No. 194,938
Int. Cl. B60b *9/06*
U.S. Cl. 152—97 **11 Claims**



A central body portion is provided for mounting on an axle and a set of at least three arcuate peripheral portions are arranged in spaced end to end relation about the central body portion a spaced distance outwardly of the outer periphery thereof. Coil springs are provided and connected between each pair of adjacent ends of the peripheral portions and the opposing portions of the center body portion whereby the arcuate peripheral portions are biased away from but may move toward the central body portion. Also, limit structure is connected between the mid portions of each of the peripheral portions and the opposing portions of the central body limiting movement of the peripheral portions outwardly from the body and the adjacent ends of the arcuate peripheral portions are connected together for limited relative lateral movement.

3,747,659
TIRE STUD
Rolf J. Caniz, Grove City, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Aug. 30, 1971, Ser. No. 175,964
Int. Cl. B60c *11/16*
U.S. Cl. 152—210 **10 Claims**

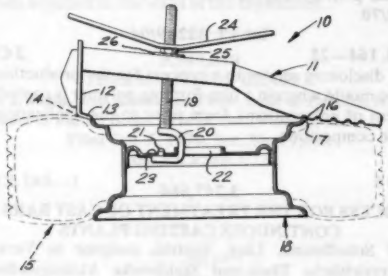


The specification discloses a tire stud in which a body with a head on one end has an axial hole extending into the body at the other end in which a hard wear resistant pin is mounted so as to project slightly from the stud body at the end opposite the head. The bore in which the pin is seated presents a discontinuous surface in the axial direction so that as the body wears off at the outer end the pin will migrate inwardly into the stud body and maintain a substantially uniform small protrusion from the outer end of the stud body throughout the life of the stud.

3,747,660
BALLASTED VEHICLE TIRE AND SELF-SEALING THIXOTROPIC BALLAST COMPOSITION THEREFOR
Donald H. Tibbals, U.S. Hwy. 95 N., Yerington, Nev.
Filed Oct. 4, 1971, Ser. No. 186,521
Int. Cl. B60c *5/00*
U.S. Cl. 152—330 **14 Claims**

Vehicle tire at least partially filled with leak-sealing, tire ballast composition in the form of an aqueous, thixotropic mixture consisting essentially of a gel-forming clay, and an alkali metal hexametaphosphate.

3,747,661
TIRE BEAD BREAKER DEVICE
George Freyling, Rt. No. 1, Box 284, Altha, Fla.
Filed Jan. 12, 1972, Ser. No. 217,092
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.17 **4 Claims**

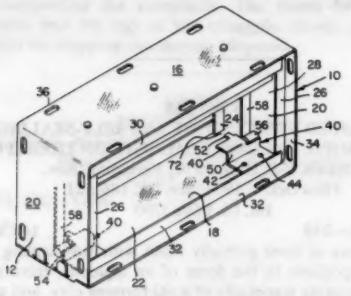


A device for aiding in removing a tire from the wheel. This device consists primarily of a frame with a blade for contact with the rim and grooves for fitting various size rims, the device carrying screw shaft means with hook means for engaging the wheel so that a bar maybe rotated upon the screw to apply pressure to the blade of the device for breaking the tire bead away from the rim of the wheel.

3,747,662
HORIZONTAL FIRE DAMPER
John C. Kurz, Philadelphia, Pa., assignor to Advanced Air, Inc., Philadelphia, Pa.
Filed Sept. 27, 1971, Ser. No. 183,818
Int. Cl. E05f *15/20*
U.S. Cl. 160—1 **3 Claims**

A fire damper construction including a peipheral frame assembly defining interior blade guides, a blade assembly of the pivotally interconnected blade type which is movable within the guides from an open position to closed position to close the fire damper unit upon presence of elevated temperatures and a locking device to maintain the blade assembly in the closed position. A spring and clip assembly affixes to a portion of the interior of the frame assembly and incorporates the locking device. A tension spring biases between the spring and

clip assembly and the lowermost blade of the blade assembly to pull the blade assembly to the closed position upon the



presence of elevated temperatures and to engage a portion of the blade assembly upon the locking device to prevent movement toward the open position.

3,747,663

PRODUCTION OF MOULDS

Percey Ronald Taylor, Wrexham, United Kingdom, assignor to Monsanto Chemicals Limited, London, England

Filed Mar. 11, 1971, Ser. No. 123,377

Claims priority, application Great Britain, Mar. 20, 1970, 13,552/70

Int. Cl. B22c *9/04*

U.S. Cl. 164—25 **3 Claims**

This disclosure relates to a process for the production of a ceramic mould wherein a film-forming polymer is coated onto a pattern of polyurethane foam prior to the application of a ceramic composition.

3,747,664

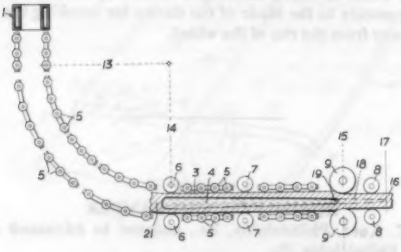
PROCESS FOR THE TREATMENT OF CAST BARS IN CONTINUOUS CASTING PLANTS

Rudolf Schoffmann, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft. Linz, Austria

Claims priority, application Austria, Sept. 4, 1970, 8045/70

Int. Cl. B22d *11/12*

U.S. Cl. 164—76 **3 Claims**



The invention relates to a process for the treatment of cast bars in continuous casting plants comprising a vertical mould, a curved and then horizontal supporting and guiding portion and a drawing and shaping stand with an adjustable roll gap, in which, in order to avoid any piping in the end part of the bar, the withdrawal speed is increased after casting is finished and the rear end of the bar is sealed so that the sump tip of the liquid bar core is shifted forward at least to the roll gap and a densening pressure is exerted upon the bar by narrowing said roll gap. With this process the output capacity of high capacity continuous casting plants is considerably improved.

3,747,665

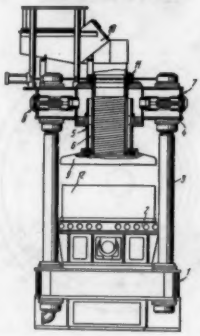
SAND-BLOWING MACHINE

Grigory Semenovich Taburinsky, 4 Grazhdskaya ulitsa, 34, korpus 3, kv. 3; Petr Iosifovich Kholodenko, Krasnokazarmennaya ulitsa, 12, korpus 4, kv. 31; Konstantin Mikhailovich Lisitsyn, ulitsa Voroskogo, 28, kv. 19; Boris Alexeevich Kinyaev, Anadrysky proezd, 47, kv. 238; Lev Abramovich Krichevsky, ulitsa Tsjurupy, 16, korpus 2, kv. 46; Nikolai Fedorovich Novozhilov, ulitsa Podvoiskogo, 10, kv. 44; Naum Borisovich Sverdlik, ulitsa 1905 goda, 9. kv. 22, **and Vladislav Iosifovich Poplavsky, Leningradskoe shosse, 120, korpus 1, kv. 81, all of Moscow, U.S.S.R.**

Filed June 10, 1971, Ser. No. 151,753

Int. Cl. B22c *15/22*

U.S. Cl. 164—200 **3 Claims**



A sand-blowing machine having a sleeve in the form of a shell made as a helical spiral with a corrugated surface, the coils of the spiral being in contact with each other over the corrugated surface and forming at the places of contact openings adapted for the passage of air.

3,747,666

MACHINE WITH ARTICULATED MOLD SETS FOR CONTINUOUS CASTING OF NON-FERROUS METALS

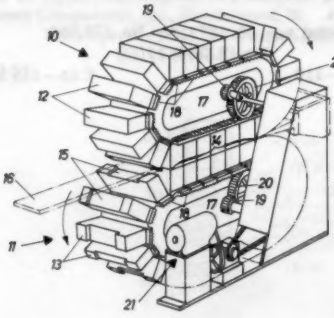
Ivan Gyongyos, Montana, Les Barzettes, Switzerland

Continuation-in-part of Ser. No. 108,529, Jan. 21, 1971, abandoned. This application May 5, 1971, Ser. No. 140,480

Claims priority, application Switzerland, May 8, 1970, 6845/70

Int. Cl. B22d *11/06*

U.S. Cl. 164—279 **2 Claims**



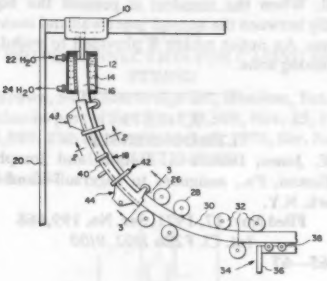
Disclosed is an adjustable hydraulic braking device for the lower articulated endless set of mold blocks of a continuous casting machine. The device is disposed to engage said mold blocks at the downstream end of the mold cavity and urges the mold blocks into contact with one another. The motor is coupled to the mold set by a transmission gearing.

3,747,667

APPARATUS FOR CONTINUOUS CASTING OF METAL STRIP

Guy F. Carle, 1210 Fremont, Muskogee, Okla.

Filed Oct. 18, 1971, Ser. No. 189,992
Int. Cl. B22d 11/12
U.S. Cl. 164—282 3 Claims



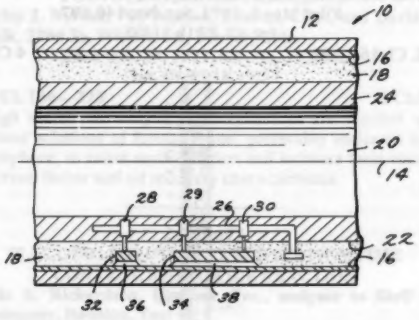
Apparatus for the continuous casting of metal strips effected in a water-cooled flow-through mold wherein the metal strip is cast in the shape of a segment of a circle and, subsequent to mold discharge, is carried by a guide track in the shape of a circle segment with provision being made for optimum cooling of the metal strip during passage therethrough by water spray impingement, with a maximal area of the guide track and strip passing therethrough being exposed to unimpeded spray cool treatment, and with minimal strip guide structures cooperating with the guide for maximum open area exposure of the cast billet for cooling.

3,747,668

CENTRIFUGAL CASTING APPARATUS

Josef Schroll, and Werner Sroke, both of Rostock, Germany, assignors to VEB Ingenieurburo Schiffbau, Rostock-Osthafer, Germany

Filed Oct. 1, 1971, Ser. No. 185,793
Claims priority, application Germany, Oct. 16, 1970, WP 31 b2/150 720; Germany, Jan. 29, 1971, P 21 04 148.5
Int. Cl. B22d 13/00
U.S. Cl. 164—287 2 Claims



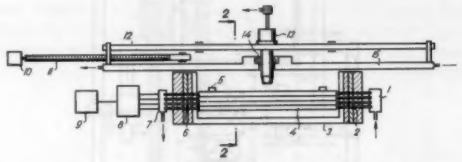
A centrifugal casting apparatus is provided with means for supporting an article in a predetermined position with respect to a mold pattern in the casting apparatus whereby the article will be imbedded in the centrifugally cast body; counterweights are provided within the casting apparatus for compensating for the buoyancy of an article being imbedded where such article has a specific gravity that is less than the casting material.

3,747,669

FURNACE FOR THE SMELTING OF METALS AND PREPARATION OF MATERIALS WITH HIGH MELTING POINTS

Vladimir Dembovsky, Ostrava, Czechoslovakia, assignor to Vyzoka skola banska, Ostrava, Czechoslovakia

Filed Jan. 28, 1972, Ser. No. 221,527
Claims priority, application Czechoslovakia, Feb. 9, 1971, 926/71
Int. Cl. F27b 14/00
U.S. Cl. 164—348 5 Claims



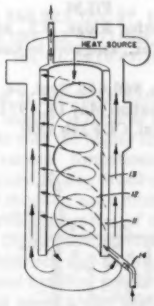
Furnace for the smelting of metals and preparation of materials with high melting points; the furnace is fitted with a horizontal trough-shaped crystallizer which has at least two working cylinders. The trough is closed at its ends by end plates. The working cylinders are driven to revolve in the same direction of rotation. The crystallizer insures perfect fusion of the whole charge and a smooth surface of the resultant cylindrical ingot while preserving a protective layer of cooler material adjacent to the walls of the crystallizer.

3,747,670

THERMAL FLUID HEATER

Lewis J. Palm, and Ronald B. Palm, both of Pulaski, N.Y., assignors to Fulton Boiler Works, Inc., Pulaski, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,820
Int. Cl. F28d 7/12
U.S. Cl. 165—1 8 Claims



A method of heating or cooling a heat transfer fluid prior to circulation through a heat exchange system wherein the heat transfer liquid is circulated helically through an elongated substantially unobstructed annular chamber. The helical flow is caused by the angle and position of entry of the fluid into the vessel. The swirling fluid is exposed to suitable heating or cooling means to transfer heat with the fluid.

3,747,671

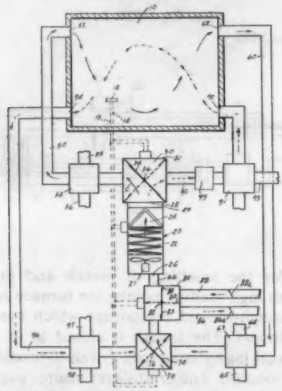
AIR CIRCULATION CONTROL SYSTEM

Louis H. Schwitzer, III, R. R. 11, Box 203 A, Bloomington, Ind.

Filed Nov. 1, 1971, Ser. No. 194,139
Int. Cl. F28f 27/02
U.S. Cl. 165—26 10 Claims

Automatic control to maintain the temperature of air within an enclosure within a predetermined temperature range and

of a generally uniform temperature from floor level to ceiling level comprises a heating and cooling source connected by duct means through control valve means to ceiling and floor vent means in the enclosure. A thermostat means in the enclosure controls the heating and cooling source as well as the control valve means so that when heating of the enclosure is required the control valve means is moved to a first position wherein heated air enters the enclosure through the floor vent



means and is exhausted from the enclosure through a floor vent means to be returned to the heating and cooling source for recycling and whereby when the enclosure temperature must be lowered the control valve means is moved to a second position whereby cool air enters the enclosure through one ceiling vent means and is exhausted from the enclosure through another ceiling vent means to be returned to the cooling source.

3,747,672

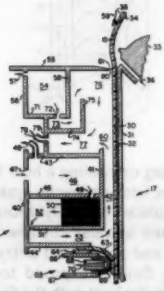
APPARATUS FOR FORMATION OF THERMOPLASTIC FILM

Howard C. North, Basking Ridge, N.J., and Charles W. Williamson, Seabrook, Tex., assignors to Esso Research and Engineering Company

Division of Ser. No. 860,610, Sept. 24, 1969, Pat. No. 3,622,659. This application May 19, 1971, Ser. No. 144,723

Int. Cl. F24h *3/00*

U.S. Cl. 165—47 **2 Claims**



A cooling cell, for containing cooling liquid, which may be adapted for use with a mandrel, and which comprises an annular body having an upstanding outer wall, first and second upstanding inner walls within the lower and upper portions respectively of the outer wall with the second inner wall being spaced at a distance from the outer wall less than that between the outer wall and the first inner wall, the two upstanding inner walls defining therebetween a mixing zone. The cooling cell has a cover plate which may fit over the cell and extend laterally to terminate at a point disposed inward of the first upstanding inner wall. There is also a bottom laterally extending wall joined to the outer wall and having a resilient sealing means projecting from its inner edge. A first inlet means is provided for admitting cooling liquid to the cell and directing it to the lower interior surface of the first inner wall. When a mandrel is present this liquid will flow upwardly between the first inner wall and the mandrel to the mixing zone. A second inlet means is provided for admitting cooling liquid to the cell and directing it to the upper interior surface of the second inner wall. When the mandrel is present the liquid flows downwardly between the second inner wall and mandrel to the mixing zone. An outlet means is provided to withdraw liquid from the mixing zone.

3,747,673

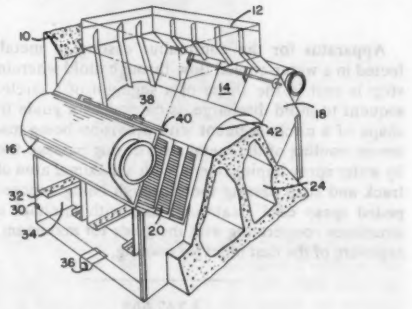
LTR CONDENSER

William E. Jones; Donald A. Halpin, and Joseph J. Biese, all of Easton, Pa., assignors to Ingersoll-Rand Company, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,468

Int. Cl. F28b *1/02, 9/00*

U.S. Cl. 165—67 **3 Claims**



A low temperature rise condenser is disclosed which employs a modular construction with relatively short tubes in a sloped position that facilitates installation and maintenance and permits a greater concentration of cooling surface for a given floor space.

3,747,674

WASH-OVER PIPE SPEAR APPARATUS

William Kirby Murray, Bossier, La., assignor to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed May 6, 1971, Ser. No. 140,697

Int. Cl. E21b *31/00*

U.S. Cl. 166—98 **4 Claims**

A wash-over pipe spear apparatus for engaging and washing over a pipe stuck within a well bore and including a wash pipe,

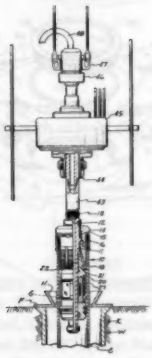
a retrieving assembly within the wash-over pipe having means for engaging the stuck pipe, releasable latch means joining the retrieving assembly and the wash-over pipe so that such assembly and pipe may be lowered into position, and a slip assembly. The retrieving assembly includes a releasable clutch which selectively controls setting of the slips and which may be operated by vertical manipulations of the supporting tubing string.

3,747,675

ROTARY DRIVE CONNECTION FOR CASING DRILLING STRING

Cicero C. Brown, 5429 Sturbridge Dr., Houston, Tex.

Continuation-in-part of Ser. No. 778,509, Nov. 25, 1968, Pat. No. 3,552,507. This application July 6, 1970, Ser. No. 52,517
Int. Cl. E21b *23/00*
U.S. Cl. 166—237 **2 Claims**



A drive connection for connecting a rotary power source to a string of well casing employed as a rotary drilling string. The drive connection is designed to be insertible in the upper end of the casing and is provided with a mandrel carrying slips and a slip expander for gripping the interior of the casing and pipe-gripping shoes operable in response to angular movement of the mandrel to apply torsional force to the casing.

3,747,676

OIL RECOVERY WITH METHYLOLATED POLYACRYLAMIDE THICKENER

Charles J. Norton, 766 Marion, Denver, Colo., and David O. Falk, 3284 So. Winona Ct., Denver, Colo.

Filed Oct. 29, 1971, Ser. No. 193,986
Int. Cl. E21b *43/22*
U.S. Cl. 166—275 **8 Claims**

High molecular weight polyacrylamides are reacted with aqueous solutions of formadehyde, preferably under an inert atmosphere, to cause methylolation and increase their viscosity, screen factor and oil recovery characteristics.

3,747,677

PLUGGING SOLUTION PRECIPITATION TIME CONTROL BY EPOXIDE REACTION

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 26, 1971, Ser. No. 192,464
Int. Cl. E21b *33/13*
U.S. Cl. 166—293 **2 Claims**

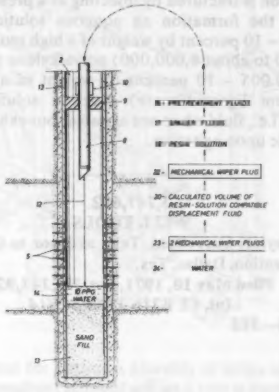
The precipitation time of a precipitate-forming aqueous solution containing a polyvalent metal that precipitates as a gelatinous metal hydroxide and a reactant that raises the pH to cause the precipitation is controlled, and/or precipitation at temperatures above about 130°F is inhibited, by dissolving in the aqueous solution a reactive mixture of halide ions and an epoxide.

3,747,678

CONSOLIDATING RESERVOIR FORMATION SAND WITH UNDERDISPLACED RESIN

John M. Waid, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Apr. 16, 1971, Ser. No. 134,782
Int. Cl. E21b *33/13*
U.S. Cl. 166—295 **4 Claims**



In a sand consolidating treatment of a cased and perforated well, a resin-forming solution that subsequently precipitates a self-curing partially polymerized resin is pumped into the well and into the sand so that enough resin solution is left within the casing of the well to substantially fill the perforated interval adjacent to the sand.

3,747,679

METHOD OF FRACTURING A FORMATION USING A LIQUID EXPLOSIVE

Leonard N. Roberts, c/o Talley Industries, P.O. Box 920, Mesa, Ariz.

Division of Ser. No. 860,883, Oct. 27, 1969, abandoned. This application Nov. 22, 1971, Ser. No. 200,860
Int. Cl. E21b *43/26*
U.S. Cl. 166—299 **5 Claims**

A liquid explosive is described which has a small critical diameter, is safe to handle, is capable of use in cold climates and yet is compatible with the higher temperatures commonly present in subterranean formations, which includes a nitroparaffin compound having dissolved therein a nitramine explosive, a ballistic modifier and a detonation aid in such proportions that the critical diameter of the explosive is on the order of 1/32 inch. Other constituents may also be added for controlling the consistency and ballistic properties as well as the manufacturing and handling properties of the explosive. A thickening or gelling agent is also preferably added to retain the ballistic modifier as well as any other suspended solids in a uniform dispersion. A method of fracturing well formations for enhancing their productivity, using such liquid explosives, is described.

3,747,680

INCREASING INJECTIVITY BY DILUTE ALCOHOL INJECTION

Albert Abrams, Houston, Tex., assignor to Shell Oil Co., New York, N.Y.

Filed July 9, 1971, Ser. No. 161,341
Int. Cl. E21b *43/22*, *43/24*
U.S. Cl. 166—305 R **6 Claims**

The effective permeability to water of a reservoir that contains residual oil near a well is improved by injecting a slug of an aqueous solution containing from about 6–20 percent of a normally liquid alcohol having a water solubility of from about 6–20 percent.

3,747,681

HYDRAULIC FRACTURING PROCESS USING POLYETHYLENE OXIDE BASED FRACTURING FLUID

John A. Davis, Jr., and John S. Rhudy, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed May 26, 1972, Ser. No. 257,127
Int. Cl. E21b *43/26, 43/27*
U.S. Cl. 166—307 12 Claims

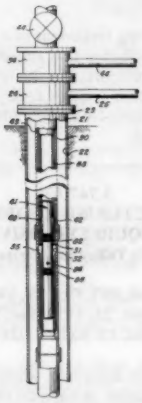
A formation is fractured by injecting at a pressure sufficient to fracture the formation an aqueous solution containing about 0.005 – 10 percent by weight of a high molecular weight (e.g., 50,000 to about 6,000,000) polyalkylene oxide polymer and about 0.005 – 10 percent by weight of a natural resin (e.g., calcium lignosulfonate). Such a solution is highly viscoelastic, i.e., fluid when not agitated, but exhibits a gel-like characteristic upon agitation.

3,747,682

WELL TOOLS

Frank H. Taylor, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 10, 1971, Ser. No. 141,922
Int. Cl. E21b *33/00, 43/14*
U.S. Cl. 166—315 25 Claims



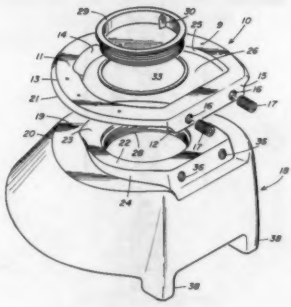
A well safety valve system controllable from the surface and adapted for installation in a well to replace a malfunctioning existing system or for conversion of a well not having a safety system. The safety valve system includes a first outer tubing string extending from a well head to the desired production zone in the well and a second inner tubing string concentrically disposed within the outer tubing string and releasably locked at the lower end thereof with the outer tubing string whereby the inner tubing string is inserted and withdrawn by manipulation from the surface. A safety valve is supported at the lower end of the inner tubing string for shutting off fluid flow into the tubing string responsive to predetermined flow conditions. The safety valve is held in an open position by fluid pressure transmitted from the surface to the valve through the annulus between the outer and inner tubing strings. In one form of the invention the outer tubing string has a landing nipple incorporated in the string at the safety valve depth and the inner tubing string includes a locking collet engageable with the landing nipple recess for locking the lower end of the inner tubing string at the landing nipple within the outer string. The inner string also has a landing nipple for the releasable locking of a safety valve which holds the inner tubing string locking collet engaged with the outer tubing string. Another form of the invention includes a landing nipple assembly releasably lockable in the smooth bore of the outer tubing string with the removable landing nipple being engaged by the inner tubing string which also has landing nipple means for supporting the safety valve. The safety valve holds the locking collet of the inner tubing string locked with the releasable landing nipple. In a still further form of the invention a removable landing nipple for releasably locking the inner tubing string within the outer tubing string is releasably locked in a landing nipple provided in the outer tubing string at the desired depth. In each installation and the well procedure therefor a plug is used for shutting the well in at the safety valve depth while running and retrieving the inner tubing string.

3,747,683

HORSESHOE ASSEMBLY

Gerald E. M. Smith, 1301 Pecan St., Marshall, Tex.

Filed Apr. 3, 1972, Ser. No. 240,419
Int. Cl. A01l *1/00*
U.S. Cl. 168—25 9 Claims



An improvement in horseshoe assemblies which permit the addition of weight to or the removal of weight from the hoof of a horse without reshoeing the horse. The improvement is characterized by a first shoe having a periphery corresponding generally to the shape of the hoof to be shod. The top surface of the first shoe is adapted to be fixed in abutment with the bottom of the hoof in a conventional manner. A second shoe member is also provided. The second shoe has a normally upwardly oriented surface which conforms to the periphery of the bottom of the first shoe and is adapted to be positioned adjacent to the bottom surface of the first shoe. Means for temporarily affixing the second shoe to the first shoe to secure the two in abutment are provided and preferably take the form of a beveled tongue portion which extends from the second shoe for mating with a beveled portion provided on the first shoe. The second shoe is also provided with recessed portions which receive screws or the like passing through the first shoe member. The screws cooperate with the beveled tongue to retain the first shoe and second shoe in abutting relationship. The second shoe may be provided with a cavity which may be filled with a variety of weight means. The weight means may be positioned within the cavity to provide a toe-weighted, heel-weighted or side-weighted shoe depending upon the particular application in which the shoe is to be used.

3,747,684

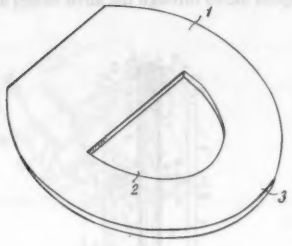
ELASTIC SOLE INSERT FOR HORSE SHOES

Bjorn Valter Wallen, Banmastarvagen 2, 163-58 Spanga, Sweden

Filed Jan. 4, 1971, Ser. No. 103,688
Int. Cl. A01l *7/02, 5/00*
U.S. Cl. 168—28 1 Claim

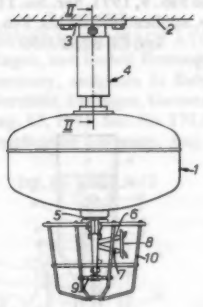
An elastic sole insert intended for placement between the hoof of a horse and the horse's shoe comprising an insert shaped to conform to the shape of the shoe and composed of relatively resilient material having wear-resistant charac-

teristics, an example of such a material being a plastic having a hardness of about 77–87 Shore A and a modulus of elasticity



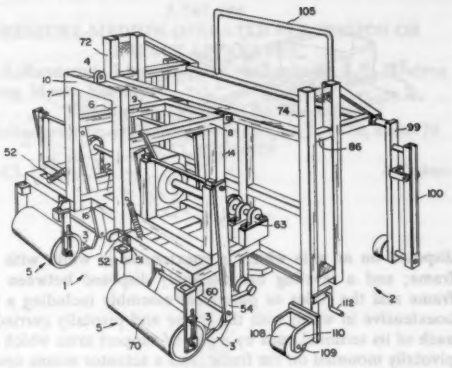
of about 100–2,000 Kp.cm², said insert being either imperforate or else provided with at least one venting aperture.

3,747,685
FIRE EXTINGUISHERS
Alister L. McCulloch, Victoria, Australia, assignor to Graviner (Colnbrook) Limited, London, England
Filed Oct. 28, 1971, Ser. No. 193,274
Claims priority, application Australia, Oct. 29, 1970, 3027
Int. Cl. A62c *35/02*
U.S. Cl. 169—26 **7 Claims**



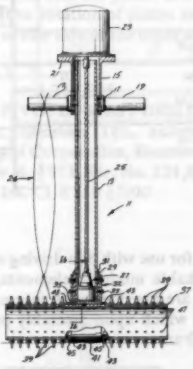
An automatic chemical-type fire extinguisher has a container for containing the extinguishant and a thermally operative valve for discharging the extinguishant in the event of fire. The container is mounted from an overhead support by an arrangement including two relatively slidable members one attached to the overhead support and one to the container. A spring acts between the two slidable members and opposes the weight of the container and extinguishant. On partial or complete loss of extinguishant, the weight becomes insufficient to oppose the spring, and the resultant relative movement of the members actuates electrical contacts to signal an alarm.

3,747,686
APPARATUS FOR HARVESTING SOD
Martin Beck, P.O. Box 752, Auburn, Ala.
Filed July 24, 1970, Ser. No. 57,933
Int. Cl. A01b *45/04*
U.S. Cl. 172—20 **11 Claims**



An apparatus for cutting a plurality of strips of sod and for winding the resultant strips of sod on a reel is disclosed.

3,747,687
SONIC HAND CULTIVATOR
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Continuation-in-part of Ser. No. 471,944, July 14, 1965, Pat. No. 3,376,798. This application June 24, 1967, Ser. No. 655,611
Int. Cl. A01b *35/00*
U.S. Cl. 172—40 **2 Claims**

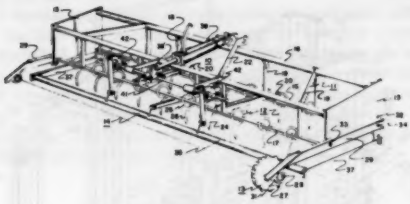


A sonic hand cultivator comprised of an orbiting-mass oscillator which in turn drives or vibrates a resonator coupled to a plurality of spikes or tines which are caused to resonantly vibrate as they embed themselves in the ground.

3,747,688
COMBINATION CULTIVATOR, ROLLER AND LEVELING BAR
Delwin G. Woerman, 420 Filmore St., Caldwell, Idaho; David G. Johnson, Rt. 3 Franklin Rd., Nampa, Idaho, and Donald F. Murphy, 609 W. Hazel, Caldwell, Idaho
Filed Nov. 10, 1971, Ser. No. 198,031
Int. Cl. A01b *5/00*
U.S. Cl. 172—149 **2 Claims**

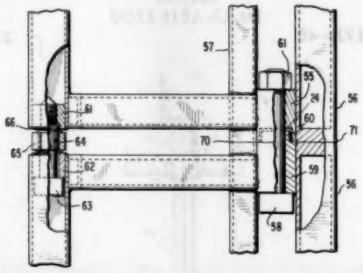
The combination cultivator, roller or pulverizer, and leveling bar of this invention comprises a substantially rectangular

solid frame; a cultivator assembly including a multiplicity of teeth disposed distally at intervals into transverse ranks in the frame, a roller or pulverizer assembly disposed distally rearwardly on the frame, being carried on the frame by a pair of support arms disposed on the outermost terminal side of the frame, and comprising a multiplicity of spur gear-like wheels



disposed on an axle which is coextensive in width with the frame; and a leveling bar assembly disposed between the frame and the roller or pulverizer assembly including a bar coextensive in width with the frame and pivotally carried at each of its terminal ends by a pair of support arms which are pivotally mounted on the frame, and a actuator means operable to selectively raise and lower the leveling bar.

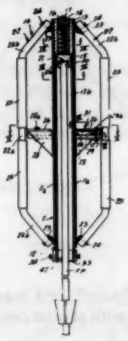
3,747,689
MODULAR LEADS
Leonard L. Frederick, 15 Crestview Ter., Whippany, N.J.
Filed May 11, 1971, Ser. No. 142,173
Int. Cl. E02d *7/00*
U.S. Cl. 173—90 **6 Claims**



A leads frame for use with pile driving machines including a plurality of stackable modular elements, the front and rear chords of which are provided with interengaging cooperative locking portions which upon assembly provide a rigid structure of the leads frame.

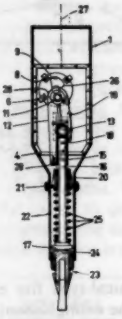
3,747,690
JACK HAMMER
Robert F. Delke, Cheyenne, Wyo., assignor to William H. Chamberlain and Anna B. Chamberlain, Cheyenne, Wyo., part interest to each
Continuation-in-part of Ser. No. 123,787, March 12, 1971. This application July 19, 1973, Ser. No. 163,696
Int. Cl. E02d *7/04*
U.S. Cl. 173—118 **14 Claims**

An improved manually actuated self-energizing jack hammer or driver useful as a demolition tool, a compactor, a post or pile driver, a digging tool and the like, composed of an inner anvil tube or barrel receiving a post or pile therein or mounting a tamper, a breaker, a cutter, a digger or the like tools and a tubular ram or hammer telescoped over and guided on the barrel with a recoil spring between the anvil and hammer for lifting the ram after it delivers a hammer blow to the anvil barrel. The inner tube or anvile barrel separates and insulates the driver member such as a fence post or tool from contact with the hammer ram and at the same time guides the ram to insure maximum direct delivery of force from the ram to the tool or post. Handles are provided on the ram for convenient grasping by a single operator to impart a rhythmic reciprocation to the ram aided by the recoil spring to deliver maximum impact blows through the anvil barrel to the tool or



post with minimum manual effort. The telescoped barrel tube and ram tube are preferably non-circular in cross-section to prevent relative rotation of the tubes and a heavy hard steel hammer head is secured in the open top of the ram tube preferably in non-mating relation to provide an air vent. The guide tube or barrel also preferably has a heavy hard steel head on the top end thereof providing an anvil receiving the blows from the hammer head. A lock bolt is provided to selectively hold the tubes in telescoped relation.

3,747,691
STRIKING MACHINE
Oskar Sigurd Lundman, Ojagatan 82, and Karl Aston Nilsson, Hassjegaton 5, both of 94020 Ojebyn, Sweden
Filed Feb. 9, 1971, Ser. No. 113,889
Claims priority, application Sweden, Feb. 13, 1970, 1851/70
Int. Cl. B25d *1/00*
U.S. Cl. 173—119 **4 Claims**



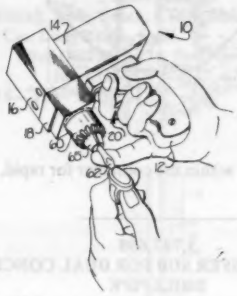
The striking machine has a hammer which repeatedly strikes an anvil to drive a tool connected thereto. The hammer is spring biased to the striking position and the hammer is raised against the spring bias by a linkage from the hammer member to a rotary cam. As the cam is rotated the hammer is raised and continued rotation of the cam provides for a lost motion wherein the hammer is released from the cam and the spring forces the hammer to strike the anvil.

3,747,692

STONESETTER'S HAND TOOL

Richard L. Davidson, Gastonia, N.C., assignor to Parrott, Bell, Seltzer, Park & Gibson, Charlotte and Robert L. Nixon, Lincolnton, both of N.C.; part interest to each

Filed Aug. 30, 1971, Ser. No. 176,130
Int. Cl. B23p 5/00; B25d 11/12
U.S. Cl. 173—122 10 Claims



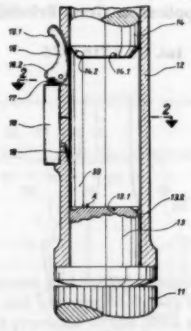
An impact generating hand tool for setting gem stones in a ring mounting or the like and which is configured to facilitate accurate guidance of the workpiece engaging portion of the tool to guard against striking and possibly fracturing the gem stone. The tool includes a downwardly directed handle, and a hammer having a workpiece engaging portion at the lower end thereof which is spaced from the handle a distance sufficient to permit the operator to contact and guide the workpiece engaging portion with his little finger. The hammer is reciprocated to provide the desired impacts on the workpiece by a mechanism which includes a reciprocating shaft positioned to strike or impact the hammer at the lowermost portion of its movement, a variable speed electric motor for reciprocating the shaft, and a motor speed control switch carried on the handle whereby the frequency and intensity of the impacts on the hammer and thus the workpiece may be controlled.

3,747,693

DIESEL PILE DRIVER FOR IMPACT ATOMIZATION

Fritz Kummel, Esslingen, and Rudolf Hennecke, Buoch-Grunbach, both of Germany, assignors to Delmag-Maschinenfabrik Reinhold Dornfeld, Esslingen, Germany

Filed Aug. 13, 1971, Ser. No. 171,524
Claims priority, application Germany, Aug. 18, 1970, P 20 40 924.9
Int. Cl. E02d 7/12
U.S. Cl. 173—128 2 Claims



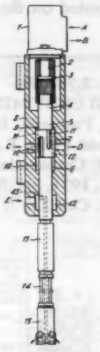
A Diesel pile driver, in which a piston operable to impact upon the impact area of an impact member atomizes the fuel conveyed by a metering pump onto the impact area of the impact member, the impact surface of said piston and the impact area of said impact member which is adapted to receive the fuel from said metering pump respectively forming plane surfaces substantially parallel to each other.

3,747,694

PRESSURE-MEDIUM OPERATED PERCUSSION OR IMPACT APPARATUS

Per Kollandsrud, Ljan, Norway, assignor to A/S Moelven Brug, Moelv, Norway

Filed Dec. 3, 1971, Ser. No. 204,607
Claims priority, application Norway, Dec. 7, 1970, 4686/70
Int. Cl. B25d 9/00
U.S. Cl. 173—137 4 Claims



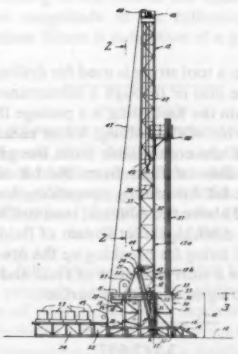
A rock drill having a reciprocating piston in a cylinder for striking the drill rod when pressure medium is supplied to alternate sides of the piston, with the piston and cylinder having grooves which on relative rotation of piston and cylinder convey pressure medium to one side or the other of the piston.

3,747,695

HIGH FLOOR PIVOTED MAST DRILLING RIG

Donald R. Branham, Houston, Tex., assignor to Pyramid Derick and Equipment Corporation, Houston, Tex.

Filed Apr. 6, 1971, Ser. No. 131,630
Int. Cl. E21b 15/00
U.S. Cl. 173—151 11 Claims



A framework type mast structure is pivotally mounted on a base structure. A self-supporting pedestal structure including a gin pole structure which is pivotally mounted on the base structure adjacent the mast structure. The pedestal structure with the gin pole is tilted to vertical position, and the gin pole

secured. Sheaves carried by the gin pole cooperate with a sling line which runs to and is looped over the hook of the traveling block of the drilling rig for purposes of raising the mast structure to an upright position. A second self-supporting pedestal structure is tilted into position on the base structure on the other side of the mast structure and below a racking board assembly carried by the mast structure which is used to support the lower end of racked drill pipe independently of the mast structure. A rotary table is supported independently of the mast structure by means of a horizontal support structure which extends through the framework of the mast structure and is supported by the two pedestal structures. A working floor is carried by the gin pole pedestal structure which, together with the rotary table and the pipe supporting floor of the second pedestal structure, is positioned at an elevated location above the base structure. In a second embodiment, a separate gin pole structure is not used and the mast raising sheaves are instead mounted on the main body of the first pedestal structure.

3,747,696

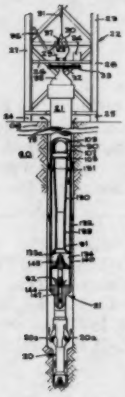
SUBTERRANEAN SLURRY MINING APPARATUS

William Z. Wenneborg, Pocatello, Idaho; Bobby R. Payne, Charleston, W. Va., and Philip R. Bunnelle, Santa Clara, Calif., assignors to FMC Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,501

Int. Cl. E21b *7/18*

U.S. Cl. 175—87 **19 Claims**



A bit attached to a tool string is used for drilling a hole from the ground surface into or through a subterranean deposit of granular ore. Within the tool string is a passage through which fluid flows to the bit while drilling. Valve means positioned within the passage are controllable from the ground surface for diverting the flow of fluid from the bit to an eductor located above the bit for mining operation. A nozzle in the tool string, located above the eductor, is controllable from the ground surface to discharge a jet stream of fluid radially outward from the tool string for breaking up the ore matrix. Then the eductor pumps a slurry mixture of fluid and granular ore through the tool string to the ground surface.

3,747,697

SELF-LOADING DRILL RIG HOPPER

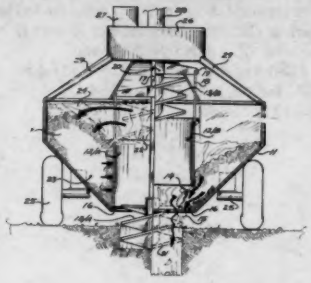
Wayne B. Russell, Jr., 3895 Lugo Ave., Lynwood, Calif.

Filed Aug. 17, 1971, Ser. No. 172,488

Int. Cl. E21b *41/00*

U.S. Cl. 175—88 **11 Claims**

A heavy-duty container having sides and a bottom so disposed as to efficiently receive earthen material, said material extracted through means of a standard drilling tool capable



of retraction directly within the container for rapid, safe, loading of material.

3,747,698

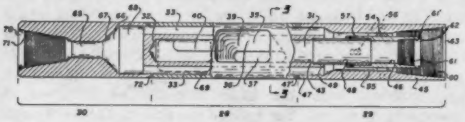
PRIMARY TRANSFER SUB FOR DUAL CONCENTRIC DRILLPIPE

Harold Sherman Chapman, 501-320 7th Ave. S.W., Calgary 2, Alberta, Canada

Filed Dec. 14, 1971, Ser. No. 207,785

Int. Cl. E21b *1/06, 3/08, 21/00*

U.S. Cl. 175—92 **14 Claims**



A downhole transfer sub for use with dual concentric drillstring and rotary drilling apparatus and a downhole percussion motor. The transfer sub, positoned immediately above the downhole percussion motor, transfers the downstream drilling fluid from the annular space in the double-wall drillpipe to the inlet bore of the downhole percussion motor, and also transfers the upstream exhausted fluid and entrained cuttings from the bottom of the borehole to the central bore of the double-wall drillpipe for return to the ground surface. Alternatively, the drill may be operated as a rotary drill with downhole percussion motor removed, in which case the transfer sub will be direct-connected at its lower end to a conventional rotary bit.

3,747,699

DIAMOND BIT

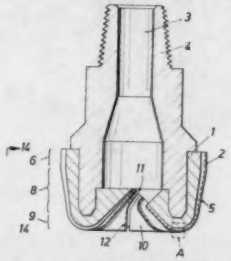
Robijn Feenstra, and Albert C. Pols, both of Rijswijk, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,037

Claims priority, application Great Britain, Apr. 23, 1971, 11,031/71

Int. Cl. E21b *9/36*

U.S. Cl. 175—329 **9 Claims**



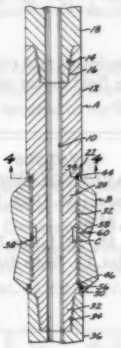
In a diamond bit having mud channels formed in the face thereof, a single row of diamonds is arranged along each mud

channel. The diamonds are positioned so that the scraping edge of each diamond is between two perpendicularly arranged planes of the diamond and so that one of these planes lies in the wall of the mud channel.

3,747,700
OIL WELL MANDREL AND STABILIZING SLEEVE ASSEMBLY

Harry L. Rilling, Long Beach, Calif., assignor to Midway Fishing Tool Co., Long Beach, Calif.

Filed Oct. 26, 1971, Ser. No. 192,248
Int. Cl. E21b *17/042, 17/10*
U.S. Cl. 175—323 **8 Claims**

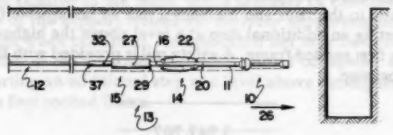


An oil well mandrel and stabilizing sleeve assembly that may be inserted as a part of a drill pipe string, with the mandrel and sleeve cooperating to maintain a body of grease under pressure therebetween to protect the engaging threads of the mandrel and sleeve from the abrading action of drilling mud, and to minimize the wear on the threads due to limited relative movement therebetween as the mandrel and sleeve are subjected to longitudinal, rotational and radially directed forces of substantial magnitude during a drilling operation.

3,747,701
ROTATIONAL DEVICE FOR EARTH BORING TOOLS

Stanley G. Atkins, and Stanley B. Baillie, both of Winnipeg, Manitoba, Canada, assignors to Armadillo Holdings Ltd., Winnipeg, Manitoba, Canada, by said Baillie

Filed Dec. 3, 1971, Ser. No. 204,615
Int. Cl. E21b *17/05*
U.S. Cl. 175—323 **3 Claims**



A spinner element and swivel component is attached just behind the first rod carrying the pilot hole forming head so that a rotation is provided to the head as it is thrust through relatively deep and long earth formations in order to keep the head in alignment and prevent or reduce deviation due to the variations in soil density, or rocks or stones, or slack or play in the rod and head assembly.

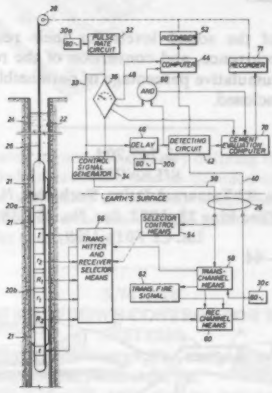
ERRATA

For Classes 177—134, 180—6.5, 180—9.2, 180—33, 180—66, 180—77, 180—75, 180—79.2 and 180—129 see:
Patents Nos. 3,747,715 thru 3,747,718 and 3,747,720 thru 3,747,726

3,747,702
CEMENT EVALUATION LOGGING UTILIZING REFLECTION COEFFICIENTS

Ralph G. Bell, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 840,335, July 7, 1969. This application May 25, 1970, Ser. No. 40,021
Int. Cl. G01v *1/00*
U.S. Cl. 181—.5 BE **45 Claims**



In accordance with principles of the present invention, methods and apparatus are provided for evaluating the cement effectiveness in cased boreholes. Acoustic energy is used to excite the borehole-casing-annulus-formation system and the radial transfer of energy into the formation is determined by examining the reflection coefficients of the system in a plurality of relatively wide frequency bands over the spectrum of the acoustic energy used to excite the system. The spectrum analysis is carried out by passing electrical signals representative of the reflected acoustic energy through a plurality of relatively wide bandpass filters whose center frequencies are selected according to the size of the casing being logged. A relatively low magnitude of the reflection coefficient in a majority of these filters is indicative of a good cement condition.

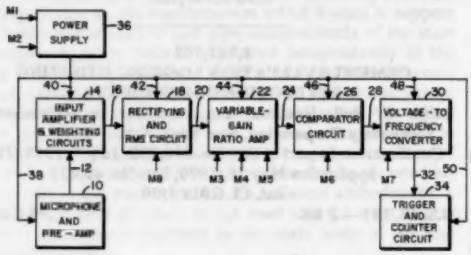
3,747,703
NOISE EXPOSURE COMPUTER AND METHOD

Michael J. Knowd, New Brighton, and Charles E. Sullivan, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1971, Ser. No. 107,336
Int. Cl. G08b *13/00*
U.S. Cl. 181—.5 AP **22 Claims**

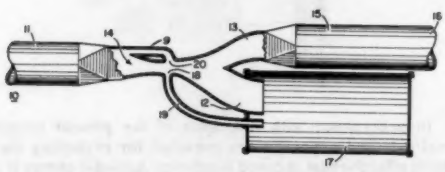
A portable, fully automatic instrument for at any given time determining precisely a person's cumulative noise exposure as a percentage of permissible noise exposure is disclosed. The instrument includes a microphone for sensing sound levels, a sound level measuring circuit, and a weighting circuit, a rectifying circuit, a variable-gain ratio amplifier, a noise threshold level circuit for removing from consideration the noise levels below a predetermined threshold level, a converter output circuit, and a readout device for indicating the cumulative percentage of allowable noise exposure that has been experienced. The instrument converts incident sound level pressures in excess of the predetermined threshold level for the

time periods of occurrence of the various sound levels into a representation indicative of a cumulative percentage of permissible noise exposure. A method for sensing sound levels above a predetermined threshold, providing a continuous



summation of the sound levels for their respective time periods of occurrence, and conversion of the resultant summation to a cumulative percentage of permissible noise exposure is also disclosed.

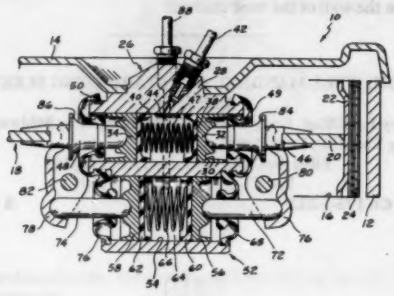
3,747,704
SILENCER
Colin C. Ware, 83 Tamarack Drive, Rochester, N.Y.
Filed May 22, 1972, Ser. No. 255,381
Int. Cl. F01n 1/08
U.S. Cl. 181—44 **12 Claims**



A silencer for attenuating sound coming from a source, having high and low fluid pressure and flow variations is disclosed. The silencer features a housing having an inlet connected to the source, a throat and two divergent branches for the flow of fluid therethrough. A first means coupled to the throat directs fluid pressure and flows from the source to one of the branches and a second means coupled to the throat diametrically opposed to the first means diverts the fluid pressure and flow to the other branch when the pressure in the second means is greater than the fluid pressure and flow at the first means. The second means includes a means for deriving a mean pressure, viz., attenuates peak pressures so that fluid pressure and flow variations at the other one of the divergent branches are reduced.

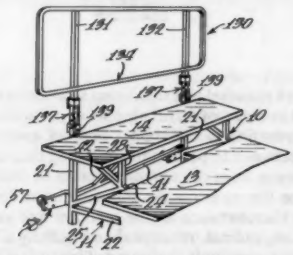
3,747,705
COMPACT ADAPTIVE BRAKING SYSTEM
Edward M. Pauwells, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Filed Feb. 3, 1972, Ser. No. 223,276
Int. Cl. B60t 8/12
U.S. Cl. 188—181 A **5 Claims**

A vehicle anti-skid system is disclosed which senses an incipient skidding condition of any of the vehicle wheels and releases the corresponding brake in response thereto, to prevent the brake from locking. The anti-skid system includes a fluid motor assembly provided for each of the vehicle brakes in addition to the conventional fluid motor assembly which effects a brake application. A linkage interconnects the two fluid motors so that when the fluid motor comprising a part of the anti-skid system is actuated, the force generated by the fluid motor which actuates the brake is overcome, permitting the brake to be released. Electrically operated valve means are responsive to an output signal from an electronic control



unit which senses the incipient skid condition to communicate pressurized fluid to the fluid motor which forms a part of the adaptive braking system.

3,747,706
PORTABLE FOLDING RISER
David L. Paine, and Harvey M. Urch, both of c/o Wenger Corporation, Owatonna, Minn.
Filed Nov. 18, 1971, Ser. No. 200,115
Int. Cl. E04h 3/12
U.S. Cl. 182—113 **10 Claims**

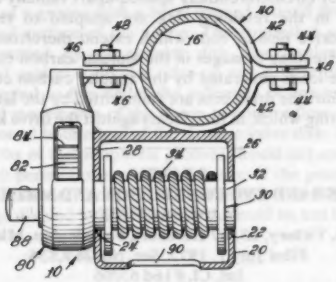


A portable folding riser for supporting a choir or the like including a pair of skeletal floor-engaging support frames disposed in spaced parallel upright positions, a plurality of ascending steps having opposite ends pivotally connected to the support frames for collapsing movement of the steps and frames about parallel front-to-rear axes to storage positions with the steps lying in a common plane and the frames lying in a common plane closely parallel to the steps, a brace extending between the support frames to prevent collapsing of the frames relative to the steps, and a plurality of casters on the backs of the support frames for movably supporting the riser on edge when collapsed. An additional tier may be optionally attached to the riser and includes a pair of collapsible frames supporting an additional step at a level above the highest step on the first recited frame. A safety rail is provided with the uppermost step.

3,747,707
SCAFFOLD SAFETY APPARATUS
Joseph J. Fromlath, 430 E. Sixth St., Escondido, and Forest E. Taylor, 3630-25 Vista Campana South, Oceanside, both of Calif.
Filed Nov. 30, 1971, Ser. No. 203,202
Int. Cl. E04g 7/04, 7/28, 7/08
U.S. Cl. 182—129 **7 Claims**

A safety apparatus designed to hold the planks in place on a scaffold frame. A take-up reel is clamped to a frame post and a

cable is paid out a sufficient amount to permit its outer end to be laid across the series of planks, looped around a frame post on the other side of the planks, and hooked onto the outer end

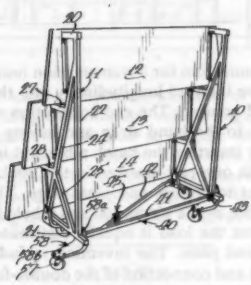


of the cable. The cable is then reeled in causing the loop to tighten. A locking mechanism prevents the reel from unwinding once the planks are secured to the scaffold frame.

3,747,708
PORTABLE FOLDING RISER

Jerry A. Wenger, Owatonna; David L. Paine, Ellendale, and Irvin E. Dorschner, Owatonna, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.

Filed Nov. 18, 1971, Ser. No. 200,134
Int. Cl. E04h *3/12*
U.S. Cl. 182—152 **15 Claims**



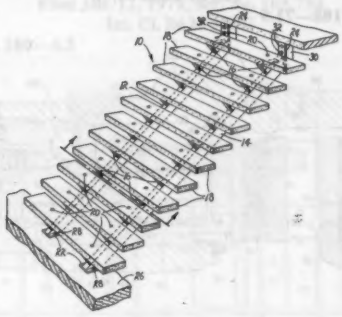
A portable folding riser for supporting a choir or the like including a pair of skeletal floor-engaging support frames disposed in spaced parallel upright positions, a plurality of ascending steps having opposite ends pivotally connected to the support frames for collapsing movement of the steps and frames about parallel front-to-rear axes to storage positions with the steps lying in a common plane and the frames lying in a common plane closely parallel to the steps, a brace extending between the support frames to prevent collapsing of the frames relative to the steps, and a plurality of casters on the backs of the support frames for movably supporting the riser on edge when collapsed. An additional tier may be optionally attached to the riser and includes a pair of collapsible frames supporting an additional step at a level above the highest step on the first recited frame.

3,747,709
STAIRWAY

Derrel J. Ridenour, 4646 E. Lewis, Fresno, Calif.

Filed Mar. 6, 1972, Ser. No. 232,074
Int. Cl. E06c *9/02*
U.S. Cl. 182—219 **1 Claim**

An improved, readily assembled prefabricated stairway having both a pleasing appearance and desired load-bearing capabilities. The stairway is characterized by a pair of parallel stringers arranged in substantial parallelism, each of the stringers including a tubular span of a pentagonal cross-sectional configuration, formed of a plurality of contiguous components of an elongated and substantially planar configuration having

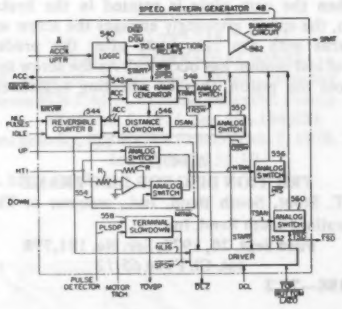


angularly related planes of symmetry defining therebetween a pair of included angles of 90° and an included angle of greater than 90°, and a plurality of stairway treads, each being coupled to the stringers at a pair of single points located adjacent to the opposite ends thereof.

3,747,710
DISTANCE SLOWDOWN CONTROL FOR ELEVATOR SYSTEMS

Charles L. Winkler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1972, Ser. No. 254,119
Int. Cl. B66b *1/30*
U.S. Cl. 187—29 R **24 Claims**

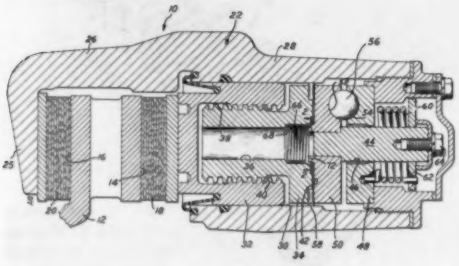


Distance slowdown control for an elevator system which provides a predetermined portion of a speed pattern used by the motor control of the elevator system. The portion of the speed pattern provided by the distance slowdown control is responsive to the distance to go to the floor at which the elevator car is going to stop. At a predetermined distance from the floor, termed the transfer point, the speed pattern is transferred from the distance slowdown control to another control. The distance slowdown control is automatically calibrated during each run of the elevator car for the specific distance to go from the transfer point to the floor. When the elevator car reaches the transfer point, the calibrated voltage from the distance slowdown control will be at the correct magnitude for transfer to the other control.

3,747,711
DISC BRAKE WITH AUTOMATIC ADJUSTER MECHANISM

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 25, 1971, Ser. No. 156,646
Int. Cl. F16d 65/56
U.S. Cl. 188—71.9 9 Claims

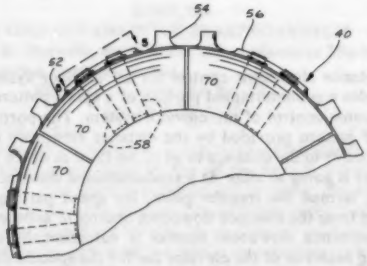


An automatic adjuster mechanism for a mechanically actuated disc brake is disclosed. The brake includes the usual caliper housing defining a bore therewithin and a piston slidably mounted in the bore. The caliper is operatively connected to a pair of friction elements, and is adapted to urge the latter into braking engagement with a rotor when the brake is actuated. An adjusting screw is threadedly connected to the piston, so that upon relative rotation between the screw and the piston the screw will extend from the piston. The mechanical actuator includes a cam plate which is rotatable from a first or brake released position to a second or brake applied position. As the cam plate is rotated from the first position to the second position, force transmitting means urge the latter axially within the bore so that the cam plate urges the adjuster screw, and therefore the piston, in a brake applying direction. A one-way clutch spring is carried in the screw and is also operatively connected to the cam plate. When the cam plate is rotated in the brake applying direction in excess of a predetermined amount, the spring turns relative to the screw. However, when the cam plate is rotated in the brake release direction, the spring grippingly engages the screw so that the latter turns with the cam plate after the predetermined amount of lost motion has occurred. As the screw turns, it extends from the piston, thereby effecting adjustment of the brake.

3,747,712
FRICTION DISC FOR DISC BRAKE

Gilbert T. Stout, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 20, 1971, Ser. No. 181,778
Int. Cl. F16d 65/12
U.S. Cl. 188—73.2 5 Claims

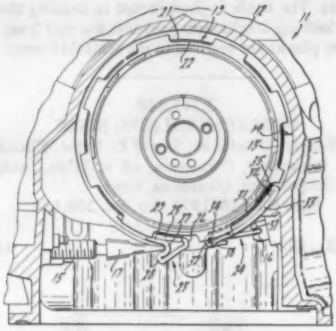


A friction disc such as a disc brake rotor having an annular core of material such as carbon or the like providing sliding frictional resistance and a heat sink for heat generated thereby. A retaining metal ring encircling the annular core is provided with circumferentially spaced-apart key slots adapted to engage drive keys suitably mounted to a wheel. A plurality of circumferentially spaced-apart radially extending openings in the retaining ring are adapted to receive associated drive pins or rods which extend therefrom through radially extending passages in the annular carbon core. Braking torque loads generated by the annular carbon core which bears against the drive pins are transmitted by the latter to the retaining ring which, in turn, bears against the drive keys.

3,747,713
BRAKE BAND END CONNECTION AND METHOD OF MANUFACTURE

Thomas J. Victory, 25167 Harcourt, Farmington, Mich.

Filed July 7, 1972, Ser. No. 269,534
Int. Cl. F16d 65/06
U.S. Cl. 188—259 4 Claims

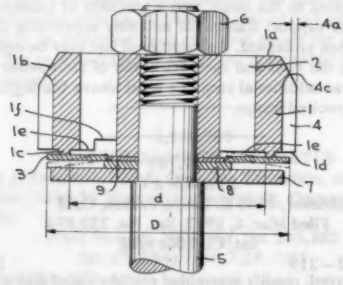


An end connection for a transmission brake band enabling the band to be inserted longitudinally into the space between the drum and housing. The end connection comprises an end plate welded to the band strap and having a reversely bent pocket. After inserting the band, a bracket is placed over the end plate with one end inserted in the pocket and the other reversely bent to engage end plate edge. The bracket has a tang engageable by the piston rod and is held in position by the housing so that the load is equally distributed between both ends of the end plate. The invention includes a method for converting an end connection of the double-fold type to a connection in accordance with the invention.

3,747,714
SHOCK ABSORBER PISTONS

Christian Bourcier DeCarbon, 64 Boulevard Maurice-Barry, 92-Neuilly-sur-Seine, France

Filed Oct. 26, 1970, Ser. No. 83,709
Int. Cl. F16d 57/00
U.S. Cl. 188—317 9 Claims



In addition to the valve controlled passageways through the shock absorber piston, there are provided a series of per-

manently open passageways in the form of longitudinal grooves in the periphery of the piston, these grooves having shallow attenuated portions formed either by double bevels in the bottom surfaces thereof or by the intersection of an end surface of a groove with a bevel formed around the periphery of an end surface of the piston. The controlled passageways are governed by an annular disk clack valve floatingly mounted against a circular ridge on one surface of the piston and adapted to flex under the influence of compression and rebound movements of the piston to control flow of damping fluid around both edges of the annular valve disk. The sum of the widths of the peripheral grooves should not exceed about 15 to 20 percent of the circumference of the piston; and the outside diameter D of the clack valve minus the diameter d of the ridge divided by the diameter d should be not less than 15 percent.

3,747,715

WEIGHING DEVICE

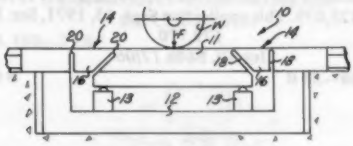
Kjell Hlege Nordstrom, and Rune Nils Allan Flinth, both of Vasteras, Sweden, assignors to Transrail AB, Vasteras, Sweden

Filed Sept. 16, 1971, Ser. No. 180,993

Claims priority, application Sweden, Sept. 21, 1970, 12805/70

Int. Cl. G01g *19/02, 21/22*

U.S. Cl. 177—134 **7 Claims**



A device for static or dynamic weighing of railway guided vehicles comprising a foundation, vehicle engaging rails forming a weigh platform adapted to engage and support the wheels of the vehicle and friction free elastic joints interconnecting the weigh rails to the foundation thereby to eliminate open joints between the ground rails and the weigh device without affecting the accuracy of the weigh device.

3,747,716

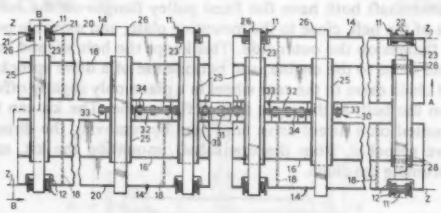
PLATFORM FOR PIT WEIGHING DEVICE

Alexander John Wilson, Sutton Coldfield, England, assignor to Girling Limited, Birmingham, England

Filed June 26, 1972, Ser. No. 266,496

Int. Cl. G01g *19/02*

U.S. Cl. 177—134 **9 Claims**



The supports of a weighbridge are box-section girders, two of which extend end-to-end along each of two opposite sides of a weighbridge pit. These girders are joined by a spider which can flex and thus transmits a proportion of the weight on the girders to a single central load cell. Adjustment can be provided in the form of nuts on threaded rods. The girders are preferably mounted so that a well defined hinge line is provided by flexure of a single face of each girder by which the girder is joined to mounting means therefor.

3,747,717

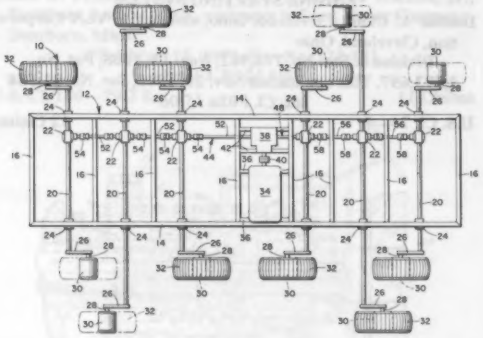
VEHICLE HAVING PLURAL MODES OF PROPULSION

John Jellinek, 21900 Drexel Dr., Mount Clemens, Mich.

Filed Jan. 12, 1971, Ser. No. 105,794

Int. Cl. B62d *57/02*

U.S. Cl. 180—6.5 **7 Claims**



A vehicle having walking, rolling and combination walking-rolling modes of propulsion. The means for propelling the vehicle in the walking mode include a plurality of axles mounted for rotation through 360°. An arm is connected to each end of each axle and a wheel is attached to the outer end of each arm. A drive means is connected to the axles for rotating the arms and wheels about the axes of the associated axles. The means for propelling the vehicle in the rolling mode include a plurality of independently operable drive means drivingly connected to the wheels for rotating the wheels about their own axes. The drive means for the axles and wheels may be operated simultaneously to propel the vehicle in the combination walking-rolling mode.

3,747,718

PUBLIC WORKS MACHINES

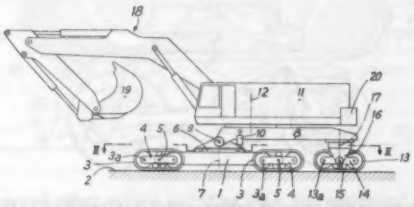
Yves M. Gauchet, Senlis Oise, France, assignor to Societe Anonyme POCLAIN Le Plessis-Belleville, France

Filed Oct. 6, 1971, Ser. No. 186,851

Claims priority, application France, Oct. 7, 1970, 7036266

Int. Cl. B62d *55/10*

U.S. Cl. 180—9.2 R **4 Claims**



This invention relates to a machine, particularly a public works machine, constituted by a first chassis provided with at least one first group of rolling members, by a turret mounted to rotate on the first chassis about a first substantially vertical axis, and by a platform provided with an operating equipment, articulated on the turret about a second axis substantially perpendicular to the first axis, and provided with a second group of rolling members capable of being oriented about a third axis which is substantially vertical, when the rolling members

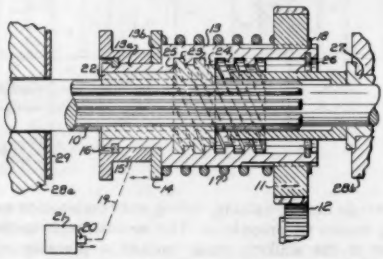
of this second group are in abutment on the ground, wherein it comprises in addition a second chassis, interposed between the turret and the platform, the second group of rolling members is mounted to pivot about the third axis of this second chassis, the platform is mounted to rotate on said second chassis about a fourth axis, which is substantially parallel to the third axis, and finally the second chassis itself is articulated to the turret about the second axis.

3,747,719

ENGINE STARTING SYSTEM

Donald A. Ciolli, Cleveland, Ohio, assignor to VLN Corporation, Cleveland, Ohio

Division of Ser. No. 774,962, Nov. 12, 1968, Pat. No. 3,593,697. This application Nov. 20, 1970, Ser. No. 91,584
Int. Cl. F02n *15/06*
U.S. Cl. 74—6 12 Claims



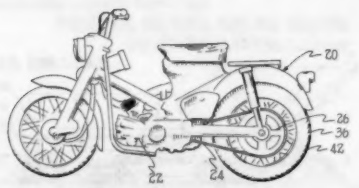
A vehicle engine starting system providing solenoid-operated positive engagement of the starting pinion with the ring gear on the engine flywheel before the starting motor is energized and inertia-operated disengagement of the pinion when the engine begins to overrun the starting motor. The system has an electrical lockout which positively prevents reengagement of the pinion as long as the engine ignition switch remains closed.

3,747,720

HUB INSERT FOR REAR WHEEL ASSEMBLIES OF MOTORCYCLES TO RECEIVE AND TRANSMIT DRIVING POWER

Melville Leroy Jensen, Bellevue, Wash., assignor to Jensen Enterprises, Inc., Bellevue, Wash.

Filed Dec. 10, 1970, Ser. No. 96,941
Int. Cl. B62d *61/00*
U.S. Cl. 180—33 R 1 Claim



In many motorcycles engine power is transmitted to the rear wheel through a chain and sprocket drive with the transfer of power occurring between a final drive flange secured to the sprocket and a hub of the rear wheel. Both the drive flange and hub have radially positioned drive ribs, also called lugs, drive plates, and power transmitters. They are generally integrally formed in sizes and locations to intermesh with more than adequate radial and axial clearance. In the clearance spaces remaining, resilient damping units are fitted. During transmission of engine power to the rear wheel, all the propelling forces are directed through the respective drive ribs of the drive flange and rear wheel hub and always through the intermediate resilient damping units.

These dampers are subject to destructive wear especially if any excessive axial clearance should develop between the final drive flange and hub. If failing damping units are not replaced soon enough, they become sufficiently destroyed and do not perform their damping and spacing function. Soon thereafter, the ribs of the drive flange and the rear wheel hub make hammering contacts with one another. If no repairs are undertaken and the motorcycle is still driven, the drive ribs are damaged and often broken away, with the ribs of the hub generally failing first.

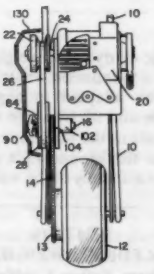
In making repairs a hub insert with its own ribs mounted on a disc is then installed in lieu of what remains and/or is thereafter intentionally cutaway of the original integral ribs of the hub. Also, the original hub of a rear wheel may be formed to receive this hub insert as an original part. Thereafter, the hub insert is easily replaced whenever the failure of resilient dampers, subsequently, causes any unwanted destruction of its drive ribs. Such destruction of drive ribs often occurs as the driving power is transmitted, when it should not be, in hopes of reaching a destination where help and/or repair services are available.

3,747,721

MINI BIKE DRIVE KIT

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Continuation-in-part of Ser. No. 73,916, Sept. 21, 1970, Pat. No. 3,625,079. This application Sept. 13, 1971, Ser. No. 179,770
Int. Cl. B60k *17/06*
U.S. Cl. 180—33 B 9 Claims



A belt transmission kit for mini bikes and the like provides variable ratio drives with small offset between the belt plane and the drive chain. A mounting plate which bolts to the engine supports a jackshaft spaced from the crankshaft. Variable-width, asymmetric V-groove pulleys on the crankshaft and countershaft both have flat fixed pulley flanges on the inner side of the belt, close to the mounting plate, and movable pulley flanges on the outer side. This keeps the belt aligned in a plane close to the engine, and permits use of a drive sprocket and chain drive to the rear wheel in a plane only slightly offset from the belt, at the same side of the engine. The kit can be mounted on a direct-drive mini bike by removing the direct-drive sprocket, from the crankshaft, mounting the kit, and shortening the chain.

3,747,722

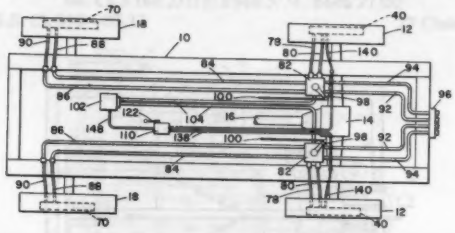
HYDRAULIC AUXILIARY DRIVE FOR VEHICLES

Frank E. Finney, 2744 Felicita Rd., Escondido, Calif.

Filed June 10, 1971, Ser. No. 151,722
Int. Cl. B60k *7/00, 23/08*
U.S. Cl. 180—66 R 10 Claims

A hydraulic auxiliary drive system which derives power from the driven wheels of a vehicle and applies that power to the normally non-driven wheels of the vehicle, or of a trailer

towed by the vehicle. The self-contained closed system includes hydraulic pump units which are simply bolted on the existing driven wheel mountings, and hydraulic motors which are bolted on the wheels to be driven. An actuating valve en-



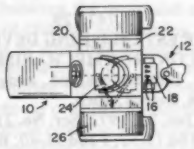
gages or disengages the drive and selection means is provided for applying the auxiliary power to the vehicle or trailer, as required. When not in use the system does not affect normal performance of the vehicle.

3,747,723

SELF POSITIONING SEAT

Wayne L. Peterson, Woodridge; David L. Blinne, Naperville, and Robert W. Sanderson, III, Lombard, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 29, 1971, Ser. No. 213,628
Int. Cl. B60n *1/02*
U.S. Cl. 180—77 S **11 Claims**



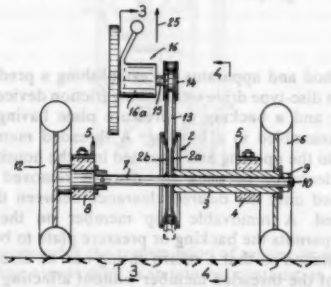
A self positioning tractor seat assembly includes a seat pivotally mounted on a cantilever shaft which is itself pivotally mounted on one side of the tractor. A cable means is provided which automatically pivots the seat when the cantilever shaft is manually pivoted.

3,747,724

BELT-TYPE CLUTCH COUPLING

Jacques Maurice Daloz, Lons le Saunier, France, assignor to Etablissements Daloz, Lons le Saunier, France

Filed Nov. 30, 1971, Ser. No. 203,147
Int. Cl. B60k *17/02*
U.S. Cl. 180—75 **5 Claims**



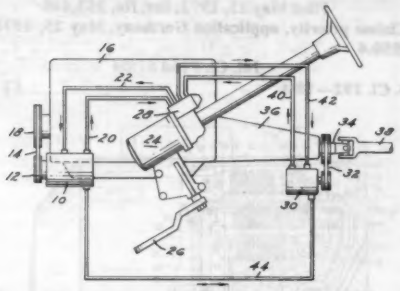
A belt-type clutch coupling comprising a driven grooved pulley consisting of a pair of flanges each rigid with one of a pair of coaxial shafts each carrying one of the wheels of the machine, and a driving pulley rigid with a power shaft parallel to said coaxial shafts and connected through a transmission belt to said driven pulley, means being provided for tensioning or slackening said belt and therefore rotatably connecting said driving pulley to said pair of flanges, or releasing completely said flanges and therefore the wheels.

3,747,725

POWER STEERING SYSTEM WITH AUXILIARY PUMP

James R. Feustel, Taylor, and Warren A. Van Wicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 15, 1971, Ser. No. 124,081
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 R **11 Claims**



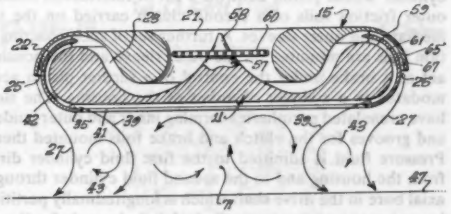
Described is a vehicle power steering system having a primary pump and a secondary pump for supplying hydraulic fluid to a steering assist mechanism. Sensing means, responsive to fluid mass flow rate through an orifice, are provided for causing actuation of valve means to disconnect the primary pump, upon failure thereof, from the steering assist mechanism and to connect the auxiliary pump thereto.

3,747,726

GROUND EFFECT VEHICLE

William C. Walter, 3025 Via La Selva, Palos Verdes Estates, Calif.

Continuation-in-part of Ser. No. 43,536, June 4, 1970, abandoned. This application Dec. 10, 1971, Ser. No. 206,758
Int. Cl. B60v *1/00*
U.S. Cl. 180—129 **13 Claims**



A ground effect vehicle including inner and peripheral annular nozzles for directing jet streams downwardly and inwardly and beneath an annular downwardly facing lifting surface which is surrounded by an arcuate annular restoring surface that angles upwardly and outwardly therefrom. The peripheral nozzle includes a skirt cooperating with the restoring surface to normally direct the peripheral jet stream downwardly and inwardly along the restoring surface to separate therefrom at a normal separation point to continue downwardly and turn outwardly to cooperate with the inner jet stream to form a generally uniform plenum chamber for

supporting the vehicle. The skirt means cooperates with the restoring surface to be responsive to one side of the vehicle being brought into closer proximity with the ground then the opposite side to cause the separation point of the peripheral jet to shift upwardly and outwardly on the restoring surface of the one side of the vehicle to thereby increase the area of the annular plenum chamber on the one side to thereby tend to raise such one side higher off the ground thus maintaining such vehicle in a generally horizontal attitude.

3,747,727

MULTIPLE COUPLING FOR PLANETARY-GEAR TRAINS

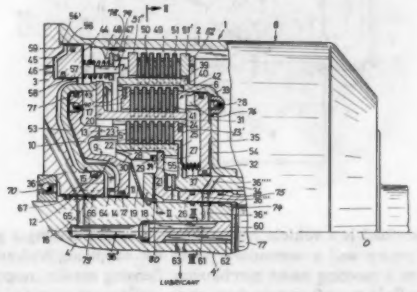
Hans Jorg Dach; Karl Heinz Bordowsky, and Manfred Bucksch, all of Friedrichshafen, Germany, assignors to ZF Getriebe Gesellschaft mit beschrankter Haftung, Saarbrucken, Industriegebiet, Sud, Germany

Filed May 15, 1972, Ser. No. 253,440

Claims priority, application Germany, May 25, 1971, P 21 25 850.4

Int. Cl. F16d 67/04

U.S. Cl. 192—18 A **12 Claims**



A multiple coupling for individually or jointly driving two nested tubular power shafts of a planetary-gear train includes three coaxial sleeves spacedly centered on a drive shaft within a surrounding housing, the two nested power shafts being supported by a free end of the drive shaft and being respectively rigid with the inner and the outer sleeve while the intermediate sleeve is secured to the drive shaft for rotary entrainment thereby. The connection between the drive shaft and the intermediate sleeve is formed as a first fluid cylinder whose piston controls a set of interleaved inner and outer friction foils of a first clutch carried on the inner and intermediate sleeves; similarly, the connection between the outer sleeve and the outer tubular shaft is formed by a second fluid cylinder whose piston controls a set of interleaved inner and outer friction foils of a second clutch carried on the intermediate and outer sleeves. A further set of such coacting friction foils are mounted on the outer sleeve and the housing to act as a brake under the control of a further piston accommodated in a cylinder chamber of the housing. The sleeves have crenelated peripheries forming inner and outer guide ribs and grooves for the clutch and brake foils mounted thereon. Pressure fluid is admitted to the first fluid cylinder directly from the housing and to the second fluid cylinder through an axial bore in the drive shaft which is longitudinally partitioned by an insert into two mutually isolated channels for the pressure fluid and for lubricant, respectively.

3,747,728

MAGNETICALLY ACUATED MECHANICAL POSITIONING APPARATUS

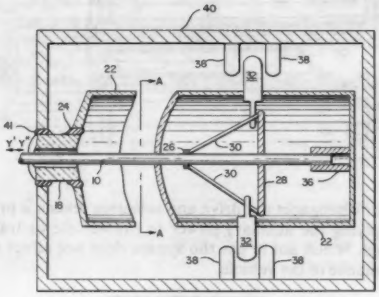
Kurt W. Hollander, P.O. Box 693, Annapolis, Md.

Filed Dec. 9, 1971, Ser. No. 206,281

Int. Cl. F16d 35/00; B64c 11/32

U.S. Cl. 192—58 A **9 Claims**

Apparatus is provided for mechanically variably positioning a work member by means of a magnetic field. The member is connected to a control rod composed of a non-magnetic material and having a magnetic terminus. This rod is axially movably located within an interior bore of a rotatable shaft which is likewise connected to the work member. A movable magnet located exteriorly of the shaft creates a magnetic field, and movement of the magnet causes the magnetic terminus of



the rod to move in a like direction which results in a corresponding movement or positioning of the work member. The apparatus is especially suitable for work devices requiring a rotating shaft to enter a fluid filled casing, e.g., a hydraulic power transfer device. It can also be used in any device where mechanically actuated movement is disadvantageous.

3,747,729

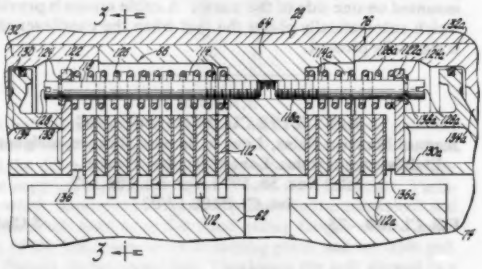
FRICTION DRIVE ESTABLISHING DEVICE CLEARANCE CONTROL MECHANISM

John E. Storer, Jr., Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1972, Ser. No. 217,149

Int. Cl. F16d 13/52; F26d 55/40; B23p 19/00

U.S. Cl. 192—70.28 **3 Claims**



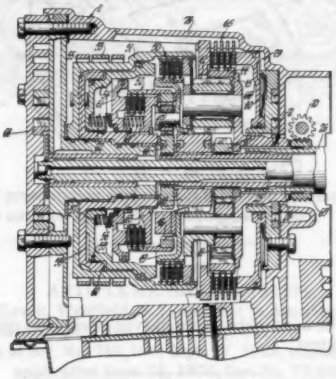
A method and apparatus for establishing a predetermined clearance disc-type drive establishing friction device. The friction disc and a backing or pressure plate having openings therein assembled in a housing. A threaded member is inserted into the opening and threaded into the housing until all of the clearance between the discs is removed and then unthreaded until the desired clearance between the discs is established. A removable stop member on the threaded member permits the backing or pressure plate to be removed and reinstalled so that a return spring can be assembled circumjacent the threaded member without affecting the preset clearance. The clearance may also be established by using shims to control clearance when the threaded member is threaded into the housing.

3,747,730

THREE-SPEED TRANSMISSION AND CONTROLS

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 415,665, Dec. 3, 1964, abandoned.
This application Nov. 12, 1965, Ser. No. 513,638
Int. Cl. F16d *25/10*; F16h *3/74*; B60k *21/00*
U.S. Cl. 192—87.11 27 Claims



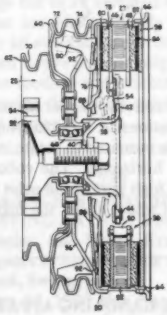
This invention provides an improved clutch and servo arrangement for automatic transmissions including a drum and two pistons for actuating two clutches wherein one piston is nested within another piston such that a servo chamber is provided between the two pistons and two additional servo chambers are provided between the drum and one of the pistons. The arrangements of clutches and gearing provides for three forward drive ratios by admitting pressure successively to the three servo chambers without the need to release pressure from any chamber during upshift ratio change. Means effective in two drive ratios is provided for decreasing the pressure in one servo chamber in response to increase in vehicle speed, and this means is controlled upon upshift to a third drive ratio to deliver full line pressure to the servo chamber.

3,747,731

CONSTANT SPEED CENTRIFUGAL CLUTCH

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 26, 1972, Ser. No. 220,978
Int. Cl. F16d *23/10*
U.S. Cl. 192—104 R 5 Claims



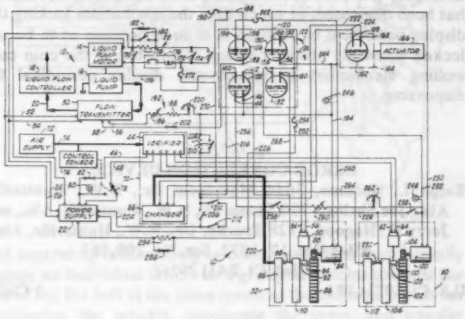
A drive system for the transmission of torque from the output of a prime mover such as an internal combustion engine to accessories associated therewith, but which limits the speed of the accessories to a substantially constant, pre-determined maximum regardless of the speed of the input. The drive system includes a friction clutch comprising a driving member and a driven member which are biased to an engaged condition by a diaphragm spring carried by the driven member. Weights attached to the spring are actuable by centrifugal force to exert a force on the spring opposing and decreasing the engaging force as output speed increases to effect a controlled slippage of the clutch.

3,747,732

AUTOMATIC CHANGE RETURN APPARATUS

Sammy C. Mitchell, 7205 N.W. 8th, Oklahoma City, Okla.

Filed Aug. 18, 1971, Ser. No. 172,743
Int. Cl. G07f *13/06*
U.S. Cl. 194—1 M 17 Claims



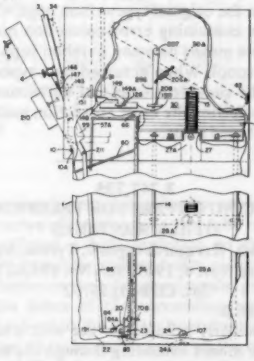
An improved automatic change return apparatus, particularly useful in cooperation with a liquid dispenser such as a gasoline pump type dispenser, wherein a verifier receives a monetary input and actuates a change calculator after verifying the genuineness of the monetary input. The change calculator includes a circuit selector having a plurality of conductive portions, and a contact movably engaging the circuit selector, the contact being moved in response to the flow of fluid through the liquid dispenser such that the contact contactingly engages predetermined conductive portions, the conductive portions being connected to various portions of a changer such that a portion of the changer is energized via the conductive portions in contact therewith to return the correct change.

3,747,733

NEWSPAPER DISPENSING MACHINE WITH MEANS TO COMPENSATE FOR DECREASING SUPPLY

Karl Knickerbocker, 400 Baycrest Dr., Venice, Fla.

Filed Jan. 19, 1970, Ser. No. 3,623
Int. Cl. G07f *11/40*
U.S. Cl. 194—10 6 Claims



This invention relates to a newspaper or periodical dispensing mechanism, wherein the dispensing operation is

under the control of a coin operated mechanism of any approved type which may be purchased on the open market and specifically comprehends mechanism for regulating the size of the dispensing opening in accordance with the thickness of the newspaper or other periodical to be dispensed, which mechanism is manually adjustable by the person supplying the dispenser with a charge of periodicals, and also includes mechanism for regulating or controlling pressure on the stack of periodicals being dispensed to prevent excessive pressure against the paper in dispensing position so as to allow its easy and not mutilated withdrawal from the mechanism, and includes a display panel wherein one of the periodicals is locked in a display panel in clear unimpeded view for a prospective purchaser, together with means locking said display periodical in display position until the last periodical in the mechanism has been dispensed, at which time the mechanism locking the display periodical in position is in such position as to be unlocked when the proper coinage is inserted in the coin controlling mechanism to release the display periodical for dispensing.

3,747,734

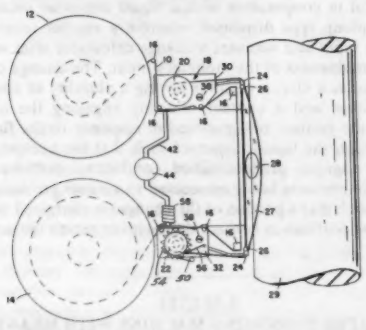
ERROR CORRECTION DEVICE

Ralph L. Norman, 3644 Marymont Dr., N.W., Huntsville, Ala.; Joe Shelton, 700 Tatom St., N.W., Huntsville, Ala., and Jerry W. Hagood, 3128 Trucker Dr., N.W., Huntsville, Ala.

Filed Dec. 17, 1971, Ser. No. 209,283

Int. Cl. B41j *29/16*

U.S. Cl. 197—181 **1 Claim**



A mechanism for use in a typewriter to aid a typist in correcting errors on the original typewritten page while it is being typed. A ribbon containing error correction material is supported by slidable means between a ribbon supply spool and a ribbon take-up spool. When actuated by a typist, a pivotable means moves the slidable means and correction ribbon into position for transferring the error correction material from the ribbon over the typed error.

3,747,735

NOISE-REDUCING COVERS FOR TELEPRINTERS AND OTHER MACHINES

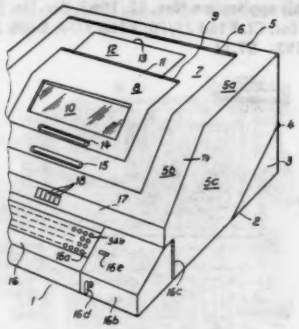
Berndt Ebbe Frick, Herrgardsvagen 9, Tyreso, Sweden

Filed Nov. 4, 1969, Ser. No. 874,027

Int. Cl. B41j *29/02*

U.S. Cl. 197—186 B **3 Claims**

A cover particularly suitable for use with a teleprinter, including aperture means extending through the cover adjacent each teleprinter key, and means projecting through said aperture means for manipulation by a teleprinter operator located externally of the cover to thereby actuate an associated teleprinter key located within the cover. The inner surface of the cover may carry a sound absorbing material and, such a



cover may be used with keyboard-type equipment other than with teleprinters.

3,747,736

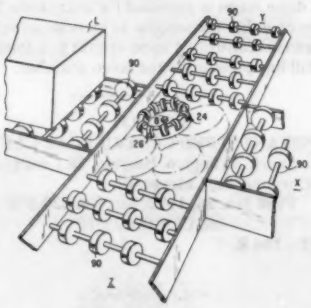
LOW PROFILE CONVEYOR ROLLER

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Continuation-in-part of Ser. No. 233,381, Nov. 23, 1971, which is a continuation of Ser. No. 884,173, Dec. 11, 1969, abandoned. This application May 3, 1972, Ser. No. 249,935

Int. Cl. B65g *47/24*, *13/00*, *13/02*

U.S. Cl. 198—25 **22 Claims**



A multi-directional conveyor roller for use under conditions of severe height limitations. A hub carrying a plurality of rollers on the periphery is mounted to rotate in a plane making an acute angle with the horizontal. The rollers are arranged to allow the roller at the high part of the orbit to contact the conveyor load. A support wheel under the high part supports the hub during rotation.

3,747,737

ARTICLE HANDLING APPARATUS

Arthur Alan Brooke, Toronto, Canada, assignor to Delamere & Williams Company Limited, Toronto, Ontario, Canada

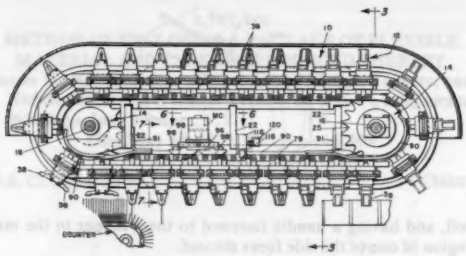
Filed Nov. 12, 1971, Ser. No. 198,179

Int. Cl. B65g *47/26*, *47/24*

U.S. Cl. 198—31 AA **34 Claims**

Apparatus comprising a conveyor provided with pairs of jaws arranged to take hold of the upper edges of the tea bags

presented thereto in succession in a common plane, turn the tea bags around to an angular position with respect to said



plane of presentation and deposit them in a column for example, on a counter with the bags in parallel relaton.

3,747,738

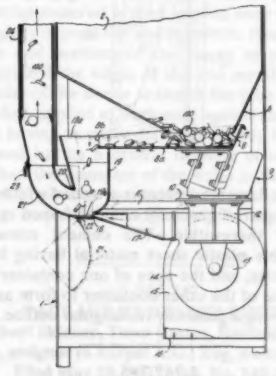
ARTICLE HANDLING SYSTEM

Eugene Greck, Westfield, N.J., assignor to American Flange & Manufacturing Co. Inc., New York, N.Y.

Division of Ser. No. 760,166, Sept. 17, 1968, abandoned. This application Sept. 18, 1970, Ser. No. 73,600

Int. Cl. B65g *47/24*

U.S. Cl. 198—33 AA **2 Claims**



A pneumatic conveyor transfers articles from a floor mounted bulk storage bin to an elevated feeding and orienting hopper. The articles are automatically dispensed from the bulk storage bin into an entrance chute on the pneumatic conveyor. At an elevated conveyor discharge station the articles are dropped into the feeding and orienting hopper which includes means for sensing the article supply and activating the dispensing means on demand.

3,747,739

APPARATUS ON A PACKING MACHINE FOR FEEDING AND SEPARATING ARTICLES FOR PACKING

Werner Fuchs, Crissier, and Ulrich Kramer, Pully, both of Switzerland, assignors to Sapal Societe anonyme des plieuses automatiques, Vaud, Switzerland

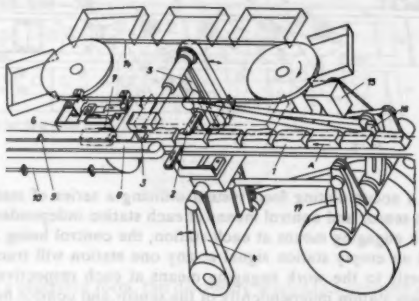
Filed Oct. 18, 1971, Ser. No. 190,075

Claims priority, application Switzerland, Nov. 5, 1970, 16414/70

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **2 Claims**

Apparatus on a packing machine for feeding and separating articles for packing, comprising an endless belt for feeding a closed column of articles, means at the end of the feed belt for positioning and releasing articles, and separating means disposed parallel to the first means for separating the articles individually or in groups in the direction of movement of the belt, and passing the same separately to discharge means, said movable means for positioning and releasing the articles periodically moving at substantially the same speed and in the same direction as the feed belt and the articles thereon, and



said separating means being so constructed that they laterally engage an individual article or a group of articles towards the end of the fed belt at the same speed as the movable means for positioning the articles, accelerate the same, and transfer them to the discharge means at a speed greater than that of the feed belt, without the continuous flow of articles being interrupted.

ERRATUM

For Class 198—76 see:
Patent No. 3,747,781

3,747,740

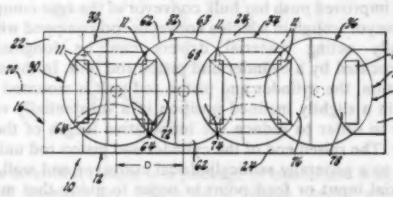
VACUUM PROCESSING MACHINE

Eugene C. Helm, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 167,566, July 30, 1971, Pat. No. 3,714,925. This application Nov. 24, 1972, Ser. No. 309,221

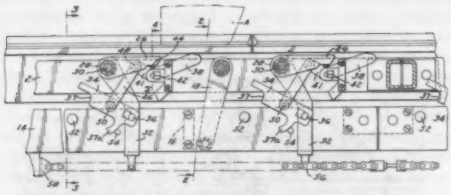
Int. Cl. B65g *29/00*

U.S. Cl. 198—209 **2 Claims**



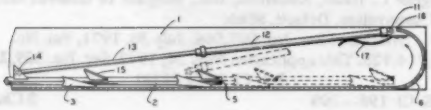
A vacuum processing machine wherein an evacuated enclosure houses a series of intermeshing two-lobe rotors which are alternately oscillated a half-revolution to thereby circumferentially shift lenticular carrier boats received within concave recesses between the lobes to a transfer position between the rotors. The lobes of the succeeding rotors sweep the recesses to thereby shift the carrier boats to the next advanced transfer position whereby parts nested on the carrier boats are bidirectionally shifted along a common entrance and exit path in a series of arcs between handling and processing stations at opposite ends of the enclosure.

3,747,741
ACCUMULATING CONVEYOR
John H. Brems, 32867 White Oaks Trl., Birmingham, Mich.
Filed July 19, 1971, Ser. No. 163,666
Int. Cl. B65g 25/08
U.S. Cl. 198—219 **25 Claims**



An accumulating feed system utilizing a series of stations with sensor and control means at each station independent of work engaging means at each station, the control being such that an empty station signal at any one station will transmit directly to the work engaging means at each respective upstream station independently of the sensor and control means at such upstream stations and without affecting the work engaging means at each downstream station; and a work engaging means so constructed and actuated that it may serve to push workpieces along the path of travel or lift and carry the workpieces along such path or a combination of these functions at respective stations.

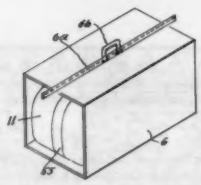
3,747,742
BULK CONVEYOR
Kurt Wissmann, Muhlenheuweg 25, 4053 Suchteln-Hagenbroich, Germany
Filed Aug. 6, 1971, Ser. No. 169,607
Claims priority, application Germany, Aug. 10, 1970, P 20 39 632.1
Int. Cl. B65g 25/08
U.S. Cl. 198—221 **2 Claims**



An improved push bar bulk conveyor of the type comprising a conveyor trough in which a conveyor rod equipped with unilaterally acting material drivers can be longitudinally reciprocated by a cylinder and piston rod unit. In the subject invention, the cylinder and piston rod unit is mounted to extend in a slightly inclined position in a substantially vertical plane in order to reduce the inoperative length of the conveyor. The raised end of the cylinder and piston rod unit is affixed to a generally semicylindrical conveyor end wall at the material input or feed point in order to guide that material drawn toward the rear of the conveyor during the return stroke of the cylinder and piston rod unit forward into the operative area of the drivers.

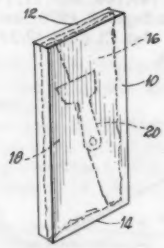
3,747,743
INSULATION PACKAGE
George A. Hoffmann, Jr., Wayne, Pa., assignor to Certain-Teed Saint Gobain Insulation Corporation, Valley Forge, Pa.
Filed Apr. 7, 1971, Ser. No. 132,088
Int. Cl. B65d 5/46, 65/10, 71/00
U.S. Cl. 206—46 R **3 Claims**

A package of insulation comprising a roll of a fibrous insulation blanket, the roll being compressed and flattened radially and being enclosed in a tubular wrapper of generally rectangular shape enclosing the flattened sides and the end faces of the



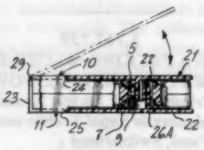
roll, and having a handle fastened to the wrapper in the mid region of one of the side faces thereof.

3,747,744
CEMENT PACKAGE
Bert H. Reed, Jr., Flossmoor, Ill., assignor to Midwest Products of Chicago, Inc., Chicago, Ill.
Filed Sept. 9, 1971, Ser. No. 179,044
Int. Cl. B65d 79/00
U.S. Cl. 206—47 R **1 Claim**



A package for flowable cement is provided which includes a carton having a pair of generally conical-shaped cement containers located therewithin. The cement containers are formed of flexible plastic sheet material having heat-sealed peripheral portions, and the apex of one container is located adjacent the base of the other container to form an assembly of containers having a generally rectangular outline.

3,747,745
TAPE CARTRIDGE CASE
Hanjiro Esashi, Sendai-shi, Miyagi-ken, and Tomio Matsumoto, Miyagi-gun, Miyagi-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Feb. 11, 1971, Ser. No. 114,533
Claims priority, application Japan, Feb. 12, 1970, 45/12170
Int. Cl. B65d 85/67
U.S. Cl. 206—52 R **10 Claims**



A tape cassette housing having two covers pivotally joined together by a side. Both covers have recesses to receive the raised portions on the sides of a cassette so that the overall dimensions of the case need be only slightly greater than the maximum dimensions of the cassette. Locking means on the inside surface of the covers extend through one of the reel

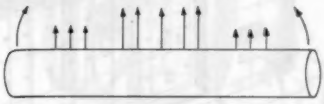
holes in the cassette to hold the two covers together and prevent the cassette from falling out.

3,747,746

METHOD OF ENCLOSING A PACKAGE OF FLEXIBLE MATERIAL AND PACKAGE PRODUCED THEREBY

James W. Newman, Scarsdale; Ronald E. Zajac, Yonkers, and Nicholas M. Bavaro, Mount Vernon, all of N.Y., assignors to Windings, Inc., Yonkers, N.Y.

Filed May 24, 1971, Ser. No. 146,209
Int. Cl. B65d *85/04*, *85/675*, *85/16*
U.S. Cl. 206—52 W 14 Claims



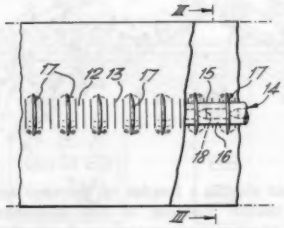
A package of flexible material of the universal type having a radial opening into the axial opening through which the inner end of the material is led out is wound on a collapsible mandrel. After the collapsible mandrel has been slightly collapsed, end members are positioned on the mandrel and are pushed towards each other to compact the package. The end members are of slightly greater diameter than the package. A tube of shrink-wrap material is then applied over the package extending slightly beyond the end members. Heat is applied by a gun to the end portions of the sleeve to produce a slight shrinking around the edges of the end members and then to the remainder of the sleeve to shrink the tube on the package. Rings are then applied at each end, against the end members, these rings having an outer diameter slightly less than the end members and having a central opening of substantially less diameter than the diameter of the holes in the end members. Heat is then applied to the ends of the package to shrink the shrink-wrap material inwardly over the end members and rings.

3,747,747

PACKAGE OF HEADED RIVETS

Edward Albert Skinner, Town Centre, Hatfield, Hertfordshire, England, assignor to Aerpat A.G., Zug, Switzerland

Filed May 28, 1971, Ser. No. 148,068
Int. Cl. B65d *83/00*
U.S. Cl. 206—56 DF 13 Claims



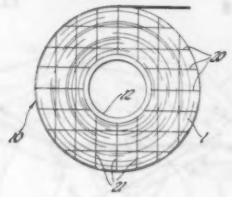
Headed rivets are packaged in rows in head to tail relationship between two webs which are adhered or otherwise fastened together in face to face relationship, the zones of the webs overlying the row of rivets having lines of weakness which extend transversely across the row of rivets and the heads of the rivets penetrate the webs along lines of weakness.

3,747,748

ROLLED ADHESIVE TAPE HAVING TRANSVERSE EDGE SLITS

John S. Kiley, Rumson, N.J., and Robert C. Jason, Warren, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 93,141, Nov. 27, 1970, Pat. No. 3,688,617.
This application June 1, 1972, Ser. No. 258,742
Int. Cl. B65d *85/67*
U.S. Cl. 206—58 2 Claims



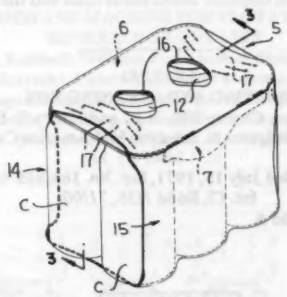
In a preferred form, this disclosure relates to a pressure sensitive, vinyl backed roll of adhesive tape whose opposite sides or side faces are slit in a particular pattern such that when the tape is unrolled its opposite side edge portions are transversely slit at longitudinally spaced locations so as to enable the tape to be easily torn transversely thereof. This disclosure also relates to a method for slitting the tape by providing a roll of tape and then cutting the sides of the roll with a cutting means to provide a plurality of slits in a particular pattern extending transversely across the side of the roll and inwardly from the side a predetermined depth.

3,747,749

SHRINK PACK WITH EASY OPENING DEVICE

William M. Brown, Darien, Conn., assignor to Ganz Brothers, Inc., Bergenfield, N.J.

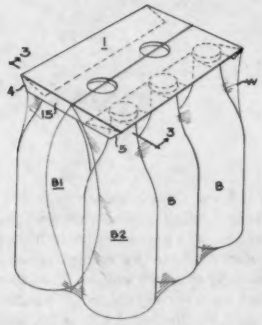
Filed Aug. 24, 1970, Ser. No. 66,494
Int. Cl. B65d *71/04*
U.S. Cl. 206—65 C 3 Claims



This invention relates to a package of containers which are secured together by means of a plastic sleeve which is wrapped around the containers with the containers being normally arranged in two rows. The sleeve is open at its opposite ends. The package is provided with a cover, formed of paperboard, which overlies the upper ends of the containers and has finger openings therein alignable between four adjacent containers. The plastic sleeve also has finger openings aligned with the cover openings and the package is opened by tearing both the plastic sleeve and the cover toward the open ends of the sleeve. The cover is provided with diverging weakening lines extending from each of the openings to an adjacent end with the weakening lines defining a tear strip extending from each opening and which, when pulled toward the end of the package, functions as a lever and a guide with respect to the plastic material of the sleeve so as to rip away a portion of the

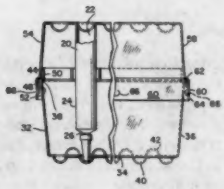
sleeve and expose the containers of the package for easy removal.

3,747,750
SHRINK FILM PACKAGE AND STABILIZING DEVICE THEREFOR
James R. Chapman, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Apr. 8, 1971, Ser. No. 132,346
Int. Cl. B65d *65/16, 85/62*
U.S. Cl. 206—65 S 7 Claims



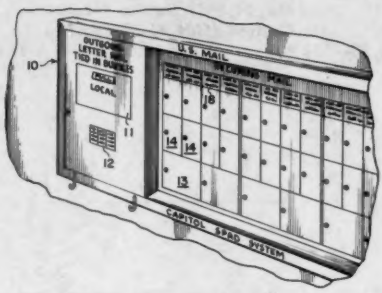
A package stabilizing device includes a main panel disposed in overlying relationship with respect to the tops of a group of articles, a pair of auxiliary panels foldably joined to said main panel along its opposite side edges, and a plurality of apertures formed in the auxiliary panels. The auxiliary panels are folded underneath the main panel to cause the apertures at least partially to envelope the upper ends of the associated articles respectively. End panels may be foldably joined to the end edges of the main panel and secured by web structure at their ends to the adjacent ends of the auxiliary panels and a shrink film overwrap is disposed about the articles and the stabilizing device.

3,747,751
SHIPPING AND CLEANING BOX
James H. Miller, Cherry Hill, N.J., and Henry S. Darlington, Aston, Pa., assignors to Teledyne Mid-America Corporation, Chester, Pa.
Filed July 15, 1971, Ser. No. 162,945
Int. Cl. B65d *1/36, 71/00*
U.S. Cl. 206—65 A 1 Claim



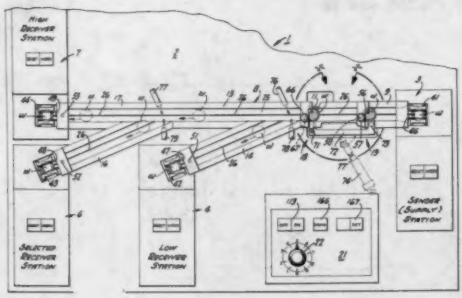
A plastic box preferably of transparent dielectric material for shipping and cleaning collapsible tubes with or without caps. Between the bottom and the top of the box, which telescopes together, a plastic separator is located which forms separator walls and compartments for the individual tubes side by side and in vertical position. The bottom of the box on its bottom wall preferably has recesses.

3,747,752
METHOD AND APPARATUS FOR MAIL DISTRIBUTION
Arthur J. Reader, 293 Pepperidge Rd., Hewlett Harbor, N.Y.
Continuation-in-part of Ser. No. 25,570, April 3, 1970, abandoned. This application Oct. 22, 1971, Ser. No. 191,702
Int. Cl. B07c *7/00*
U.S. Cl. 209—71 10 Claims



A method and apparatus for the improved distribution of mail consisting of sorting the mail at central sorting stations into containers for different addresses, placing the containers onto carts, deliverying the carts to the addressees' location and inserting the containers into each addressee's mailbox. Mailbox systems for receiving the containers are located either on the first floor of the addressee's building, or on each of the floors. The containers can be detachably stacked to form modules consisting of groups of containers for holding mail.

3,747,753
FLUID BEARING APPARATUS AND METHOD FOR HANDLING AND GAGING ARTICLES
Alan G. Flint, San Jose, Calif., assignor to Industrial Systems Corporation, Santa Clara, Calif.
Filed Jan. 24, 1972, Ser. No. 220,336
Int. Cl. B07b *13/04*
U.S. Cl. 209—73 33 Claims



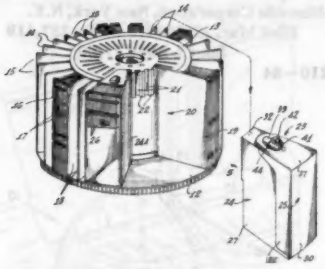
An improved apparatus and method for sorting articles, such as silicon and like wafers used in making electronic devices, according to size. Articles are transferred on a fluid bearing track structure in sequence to a gaging station following which the measured articles are selectively directed to a predetermined receiver station according to their size.

3,747,754

CARROUSEL-MOUNTED MICROFICHE MAGAZINE

William O. Nix, Newport Beach, and Timothy P. Fitzgerald, Los Angeles, both of Calif., assignors to Image Systems Inc., Culver City, Calif.

Continuation of Ser. No. 056,537, July 20, 1970, abandoned.
This application Nov. 10, 1971, Ser. No. 197,235
Int. Cl. B07c 5/34
U.S. Cl. 209—80.5 16 Claims



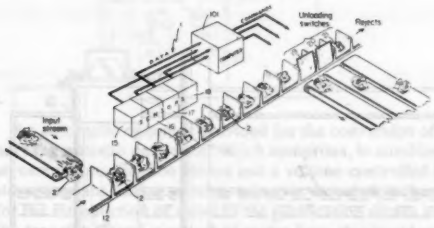
A magazine for a plurality of microfiche adapted to be selectively associated with and to become a part of a carrousel holding a plurality of microfiche which are individually code identified for random access storage and retrieval of the microfiche from the magazine and carrousel. The magazine is substantially segment-shaped and comprises a carrousel supported and microfiche supporting body portion and a cover therefor which is removed to provide access to the microfiche therein. The body portion has means at the narrow end of the segment which interlocks with the carrousel to mount the magazine thereon.

3,747,755

APPARATUS FOR DETERMINING DIFFUSE AND SPECULAR REFLECTIONS OF INFRARED RADIATION FROM A SAMPLE TO CLASSIFY THAT SAMPLE

Stephen D. Senturia, Newton Centre; David G. Wilson, Cambridge, both of Mass., and Paul Frank Windkler, Jr., Middlebury, Vt., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 27, 1971, Ser. No. 212,607
Int. Cl. B07c 5/34
U.S. Cl. 209—111.5 16 Claims



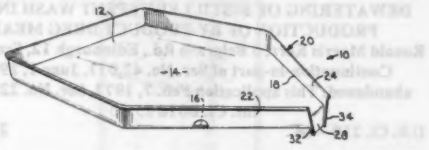
Apparatus operable to subject a sample to a broad-spectrum of radiation and to measure diffuse and specular reflected radiation from the sample to serve as a basis for classifying that sample. The radiation reflected from the sample ordinarily contains a number of wavelengths. The relative intensities of the radiation reflected from the sample at several wavelengths form a signature which identifies that radiation as belonging to a typical reflection from a particular group of materials. The signature is analyzed in apparatus employing the present inventive concept. The analyzing mechanism includes a digital computer which receives conditioned data from radiation sensors and categorizes the data on the basis of information known about test samples to provide an output which is fed to a classifier wherein mathematical calculations are performed to identify the signature as one emanating from a particular class of materials.

3,747,756

SORTING AND POURING TRAY

Lloyd M. Wheeler, 9431 Glenwood, Overland Park, Kans.

Filed Jan. 10, 1972, Ser. No. 216,632
Int. Cl. B07c 7/04
U.S. Cl. 209—123 7 Claims



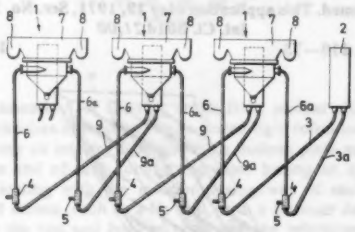
A tray for depositing objects in a container utilizes a generally planar member which presents a pouring and sorting surface. The surface has a pair of longitudinally extending converging edges with an outlet opening in the member between the edges for allowing objects to gravitate from the surface. Sidewall structure encloses the surface and extends along the converging edges to cooperate with the member in presenting a pouring spout for directing objects to the opening. A lip projects from beneath the plane of the member and can be placed over an opening in a container to hold one end of the tray, and also facilitate pouring of objects into the container. The lip is located beneath the outlet opening in the member and an extension of the sidewall structure cooperates with the lip to present a funnel extending from the outlet opening. When the member is placed on a surface the lip presents a supporting leg which holds one end of the member in an elevated position to facilitate sorting of objects. The end of the member opposite the lip is of a width sufficient to present a stable base for the tray.

3,747,757

METHOD AND MACHINE FOR FLOTATION OF MINERALS OR THE LIKE

Carl-Heinz Kalthoff; Wilhelm Freis, both of Steinenbruck, and Peter Wilczynski, Untereschbach, all of Germany, assignors to Aktiengesellschaft des Altenbergs fur Bergbau und Zinkhuttenbetrieb, Bensberg-Untereschbach, Germany

Filed Oct. 29, 1970, Ser. No. 85,147
Int. Cl. B03d 1/26
U.S. Cl. 209—164 24 Claims



A flotation machine having a battery of centrifugal cells which are disposed at the same level. The first cell receives a continuous stream of reagent-containing slurry from a receptacle and each other cell receives a continuous stream of slurry from the bottom part of the preceding cell. Each cell has a sealed annular cyclone chamber which receives slurry from the bottom part of the preceding cell or from the receptacle, and a froth collecting chamber which is surrounded by the

respective cyclone chamber. The slurry rises into the cyclone chambers under the action of compressed air which is pumped into the slurry in such quantities that the surplus of air forms in each cyclone chamber a cushion from which air is withdrawn in controlled amounts for introduction into slurry which is being drawn from the bottom part of the respective cell. Compressed air serves to convey as well as to be dispersed in the slurry with attendant formation of froth which rises in and is withdrawn at the top of the corresponding froth collecting chamber.

3,747,758

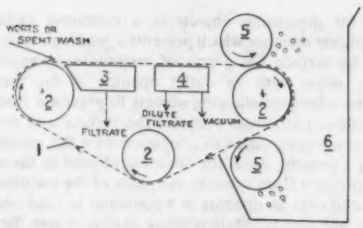
DEWATERING OF DISTILLERY SPENT WASH IN THE PRODUCTION OF BY-PRODUCT DREG MEAL

Ronald Morris Kerr, 6 Belgrave Rd., Edinburgh 12, Scotland

Continuation-in-part of Ser. No. 42,071, June 1, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,106

Int. Cl. B01d *25/36*

U.S. Cl. 210—66 **2 Claims**



The invention provides a method of and apparatus for recovering dissolved and suspended solids from a process for the production of grain whisky. The wort from a mashing tun or spent wash from distallation plant is fed on to a continuously moving filter screen in the form of a continuous belt. The wort or spent wash is fed on to the respective filter screen which moves at several hundred feet per minute so that a major portion of the liquid filters by gravity leaving on the screens a random dispersion of solids. The screens with the solids thereon are passed over or vacuum station for further dewatering and the dewatered solids are removed by adhesion to at least one roller where they are removed by centrifugal force into a hopper.

3,747,759

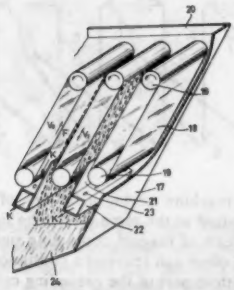
ARRANGEMENT FOR SEPARATION OF SUSPENDED OR EMULSIFIED MATERIAL FROM A LIQUID

Gunnar Olgard, Vikgatan 3 c, Nynashamn, and Ake Jernqvist, Bygglovsgrand 15, Lund, both of Sweden

Continuation-in-part of Ser. No. 797,452, Feb. 7, 1969, abandoned. This application May 19, 1971, Ser. No. 144,985

Int. Cl. B01d *21/00*

U.S. Cl. 210—73 **16 Claims**



The present invention concerns a method of separating suspended or emulsified material from a liquid during its flow in at least one channel and also an apparatus for performing this method. It is found that the separation effect is highly increased when one or more channel walls are moving in their own longitudinal direction and the longitudinal direction of the channel.

3,747,760

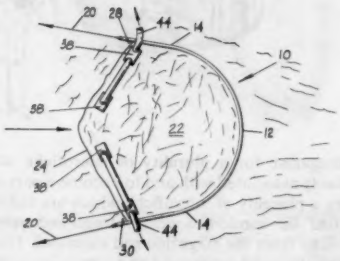
METHOD OF RECOVERING OIL FROM A WATER SURFACE

Wendell Graydon Ekdahl, Martinsville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Mar. 23, 1972, Ser. No. 237,419

Int. Cl. B01d *21/00*

U.S. Cl. 210—84 **2 Claims**



A method for recovering oil from a water surface, wherein the water carrying the oil is flowing in a specific direction relative to a barrier, comprises containing the oil in the barrier to form a confined oil slick having a leading edge. Due to the flow of the water, a head-wave is formed along the leading edge of the confined oil slick and oil removal aparatus is located at the head-wave to remove oil from the head-wave.

3,747,761

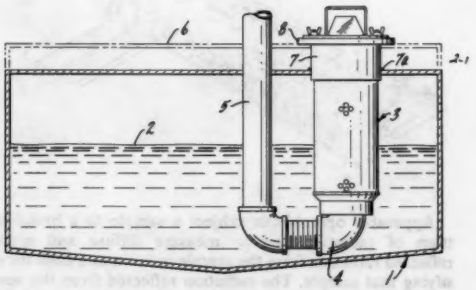
CONTINUOUS FLOW SUCTION FILTER

Peter Heinrich, Jr., Chicago, Ill., assignor to Marvel Engineering Company, Chicago, Ill.

Filed Nov. 3, 1971, Ser. No. 195,382

Int. Cl. B01d *35/02, 27/10*

U.S. Cl. 210—120 **15 Claims**



An in-reservoir suction filter assembly wherein a perforated housing contains a filter element removable from outside the reservoir enabling fluid flow with the element removed, the filter element including a shroud insuring filtration at varying reservoir fluid levels with the element present in the housing. A purge valve releases entrapped air upon element insertion.

3,747,762

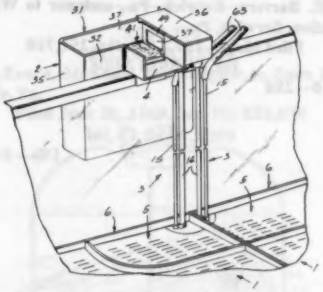
REVERSE FLOW AQUARIUM FILTER DEVICE

Eugene B. White, Oak Park, Ill., assignor to Filters International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 67,649, July 31, 1970, abandoned, which is a division of Ser. No. 805,274, March 7, 1969, Pat. No. 3,578,169. This application May 10, 1971, Ser. No. 141,828

Int. Cl. E04h *3/20*; B01d *27/02*

U.S. Cl. 210—169 5 Claims



A filter structure for use in a aquarium water purification system, particularly as a tertiary filter in a system utilizing a shallow gravel trickling filter with underwater aeration and sedimentation followed by anaerobic action and final tertiary cycle.

3,747,763

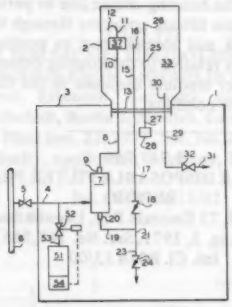
FLUID TREATING SYSTEM

Calvin L. Kain, c/o J. E. Phillips, 2716 Warwick Ct., Bartlesville, Okla.

Filed June 1, 1971, Ser. No. 148,798

Int. Cl. B01d *31/00*

U.S. Cl. 210—181 15 Claims



An automatic system is provided for the conversion of ordinary tap water to pure water which comprises, in combination, an osmotic purification means and a volume-controlled liquid storage means having suitable means in association therewith for the introduction of water to the purification means and for the transfer to and removal of water from the liquid storage means.

3,747,764

MOVING BED REACTOR

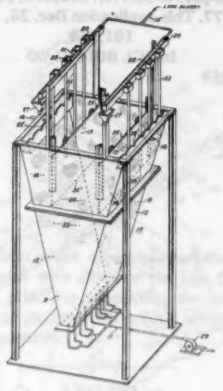
Hugh S. Graham, Bethlehem, and Charles R. Hughes, Hellertown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 5, 1971, Ser. No. 131,303

Int. Cl. B01d *23/10*

U.S. Cl. 210—189 13 Claims

An apparatus for the precipitation of metal compounds from acid waste solution comprises a vertical reaction vessel having a reaction chamber for the upward passage of a liquid suspension of solid particles and means for forcing the particles upward. The apparatus is also provided with overflow means for flowing particles to a recycling chamber, separate



ports of entry for a precipitant and for liquid feed, a reservoir above the reaction zone for containment of treated waste liquor, and an exit port for removal of the treated liquid from the apparatus.

3,747,765

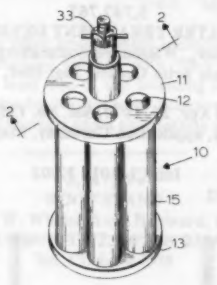
RIGID FILTER ASSEMBLY

Thomas A. Nowak, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed June 9, 1971, Ser. No. 151,369

Int. Cl. B01d *29/20*; C04b *21/00*

U.S. Cl. 210—238 7 Claims



Filter assembly for filtering solids from molten aluminum metal comprises at least one open-ended rigid refractory filter tube having an interior passageway, a bottom plate acting to close one end of such tube, a top plate having an aperture communicating with the interior passageway of such filter tube, and means, such as a tie bolt, with a fastener device to maintain the top and bottom plate and the interposed filter tube or tubes in sealed relationship so that the molten metal will flow through the walls of the rigid refractory filter tube without leakage at the ends or joints, to efficiently remove solid contaminants from the metal. The plates and tie rod or the like are of metal resistant to attack by molten aluminum, advantageously of cast iron. The refractory material of the tubes contains refractory particles resistant to molten aluminum and a bonding agent containing not over 10 percent silica.

3,747,766

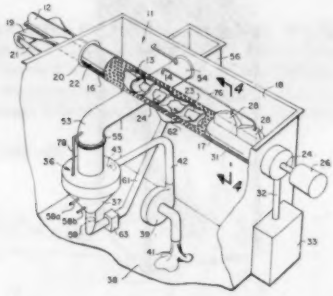
CONTINUOUS FILTER SYSTEM FOR WASTE USING ROLL FILTER PAPER OR OTHER SELF-CLEANING FILTER

Frederick J. Brooks, San Rafael, Calif., assignor to Astrotronics Research Ltd., British Columbia, Canada

Continuation-in-part of Ser. No. 832,052, June 11, 1969, Pat. No. 3,630,377. This application Dec. 28, 1970, Ser. No. 101,858

Int. Cl. B01d 35/00

U.S. Cl. 210—259 10 Claims



Household and other waste consisting of liquid and solids conveyed by water is discharged into the system through the inlet pipe. Filter paper from a roll is fed around the inlet pipe and formed into a tube, which continues beyond the end of the inlet pipe and encapsulates all the waste. The end of the inlet pipe and the extending paper tube are enclosed in a perforated or porous pipe which prevents the tube from opening. A screw in the last half of the porous pipe twists the paper into nodules enclosing solid waste while the liquid waste is squeezed and filtered through the paper and the perforated pipe. A dehydrator fed by the screw decomposes the filter paper and solid waste matter contained therein.

3,747,767

WATER TREATMENT DEVICE

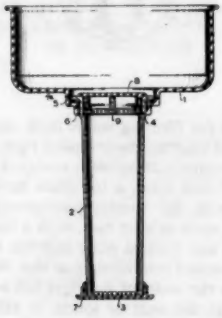
Heinz Hankammer, Wiesbaden-Sonnenberg, Germany, assignor to Chemie Brita Geraete Ing. Itter, Wiesbaden, Germany

Filed Apr. 29, 1971, Ser. No. 138,628

Claims priority, application Germany, May 13, 1970, P 70 17 889.1

Int. Cl. B01d 27/02

U.S. Cl. 210—282 5 Claims



A water treatment device is formed of a funnel-shaped part and an elongated tubular-shaped shell having one end fitted into the funnel-shaped part. The shell in combination with a screen-like closure at each end forms a chamber which contains a granular cleaning agent not soluble in water. The screen-like closures are formed to provide openings for the water but to prevent any passage of the granular material. The funnel-shaped part is more elastic than the shell and deforms when the shell is inserted into it so that a seal-type engagement is provided between the two. Removable covers can be provided for the opposite ends of the shell.

3,747,768

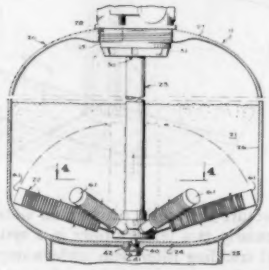
FILTER UNIT AND FILTRATE COLLECTOR THEREFOR

Salvatore E. Barrera, Berwick, Pa., assignor to Wilkes Pool Corporation, Berwick, Pa.

Filed May 9, 1972, Ser. No. 251,760

Int. Cl. B01d 29/08

U.S. Cl. 210—288 16 Claims



A filter unit generally including a tank having a restricted opening into which a fluid distributor may be fitted, a return conduit disposed within the fluid tank and connected to the distributor, at least one filtrate collector disposed in the tank, including a housing defining a fluid chamber communicating with the return conduit and a plurality of filtrate collector conduits operatively connected to the housing for pivotal movement in planes including a longitudinal center line of the housing whereby the collector units may be moved together to positions adjacent the housing center line to permit the insertion or removal of the filtrate collector through the restricted opening of the tank and spread apart to positions disposed substantially radially relative to the housing center line, within the tank, and a filter medium disposed in the fluid tank embedding the collector conduits.

3,747,769

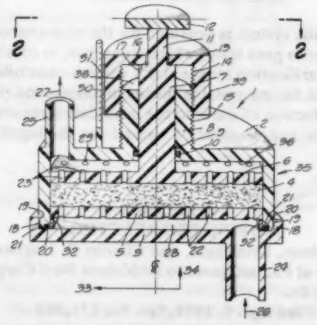
COMPRESSIBLE DISPOSABLE FILTER PRESS FOR BLOOD

Robert C. Brumfield, 73 Emerald Bay, Laguna Beach, Calif.

Filed Aug. 2, 1971, Ser. No. 167,965

Int. Cl. B01d 33/00

U.S. Cl. 210—350 5 Claims



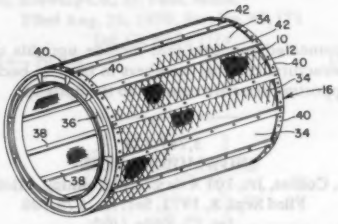
An open cell, compressed, elastic plastic foam filter medium, having average diameter cell pore openings selected

values ranging from 25 to 150 microns, is disposed as a planar volume in a an adjustable disposable filter press. The filter medium is disposed between a pair of rigid filter press plates, which are in turn disposed in the filter press structure. The press can provide an adjustable control means suitable for varying the average diameter of the pore openings, by varying the compression of the filter medium. A flexible, filter press case provide means of assisting blood circulation through the filter medium, and of separating air entrained in the blood in the filter press.

3,747,770
FILTER SCREEN

Ramon J. Zentis, McKean, Pa., assignor to Zurn Industries, Inc., Erie, Pa.

Filed June 20, 1969, Ser. No. 835,078
Int. Cl. B01d *33/06*
U.S. Cl. 210—402 **9 Claims**

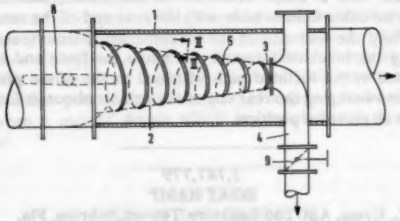


There is provided an improved filter medium characterized by a very fine mesh woven wire straining fabric supported on a relatively large open mesh grid having substantially planar faces and cohered to the grid by sintering and without the aid of adhesives.

3,747,771
DEVICE FOR SEPARATING SOLIDS AND OTHER FOREIGN BODIES FROM LIQUIDS IN A PIPE CONDUIT

Klaus Ruthrof, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 22, 1971, Ser. No. 210,784
Claims priority, application Germany, Dec. 24, 1970, P 20 63 891.9
Int. Cl. B01d *35/02*
U.S. Cl. 210—409 **8 Claims**

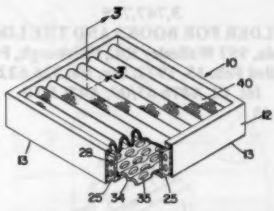


A device for separating solids and other foreign bodies from liquids in a pipe conduit includes a screen mounted in the conduit which is conically tapered in the flow direction. A discharge tube for the separated solids, leading to the outside, is connected at the apex of the screen. A barrier is arranged on outer side of screen which extends perpendicularly to the surface of the screen between the individual rows of holes of the screen.

3,747,772
FILTER

Carl Brown, Birmingham, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed May 21, 1971, Ser. No. 145,628
Int. Cl. B01d *27/06*
U.S. Cl. 210—493 **2 Claims**

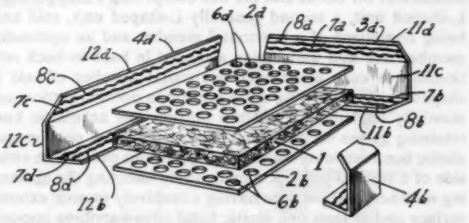


A filter for fluids in which a generally planar pleated filter element of fine mesh wire cloth or the like and a generally planar perforated plate for supporting the pleated element have their marginal portions embedded within a perimetric frame of resilient material.

3,747,773
DUAL GLUING FILTER

Robert L. Jackson, Louisville, Ky.

Filed Sept. 27, 1971, Ser. No. 183,789
Int. Cl. B01d *27/08*
U.S. Cl. 210—495 **6 Claims**

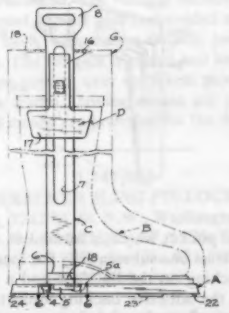


A fluid treating filter arrangement including a filter frame enclosing two retaining screens with filter media disposed therebetween, at least one of the retaining screens being attached to the frame by two types of adhesives, the adhesives utilized being a fast setting and a slow setting adhesive.

3,747,774
BOOT STAND

John Kulik, 1420 W. Winton Ave., Hayward, Calif.

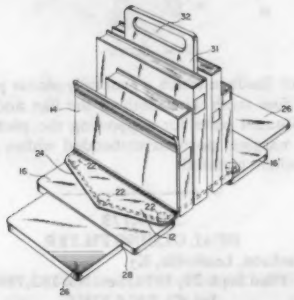
Filed Mar. 6, 1972, Ser. No. 231,939
Int. Cl. A47f *7/08*
U.S. Cl. 211—37 **4 Claims**



A boot stand comprising a base with a centrally disposed upright rising vertically therefrom and dividing the base into

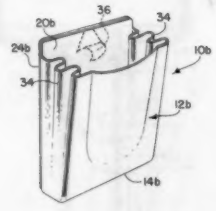
two equal areas, each one supporting the sole of a boot. Novel boot-clamping means is adjustable vertically on the upright and is designed to clamp the tops of the legging portions of the boots against the adjacent surface of the upright so as to support the boot leggings in an upright position regardless of their length.

3,747,775
HOLDER FOR BOOKS AND THE LIKE
Anthony Merola, 957 Wellesley Rd., Pittsburgh, Pa.
Filed Feb. 15, 1972, Ser. No. 226,622
Int. Cl. A47b *65/00*; A47f *5/10*
U.S. Cl. 211—43 **21 Claims**



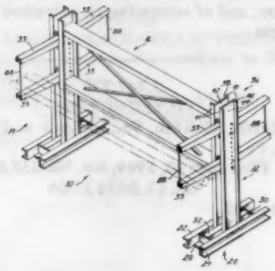
A holder for books and the like comprising a first generally L-shaped unit, a second generally L-shaped unit, said units being comprised of a horizontal member and an upstanding member and said units being arranged in back-to-back relationship to each other each horizontal member of said L-shaped units comprising a top portion, a bottom portion substantially coplanar to said top portion and an elastic band retaining means secured to at least said bottom portion, said elastic band retaining means having portions situated on either side of a vertical plane perpendicularly bisecting the upstanding member, said portions having a realtively smooth external surface and at least one elastic band circumscribing opposite portions of the elastic band retaining means on each of said L-shaped units about said relatively smooth surfaces.

3,747,776
DETACHABLE POCKET
George E. Gross, 411 N. 7th St., St. Louis, Mo.
Continuation-in-part of Ser. No. 880,818, Nov. 26, 1969, abandoned. This application May 17, 1971, Ser. No. 144,111
Int. Cl. A47f *5/08*
U.S. Cl. 211—88 **5 Claims**



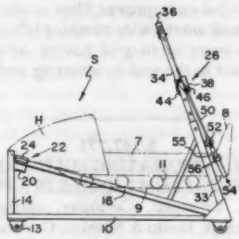
A detachable pocket which is formed as a pouch-like element having at least one substantially flat face is provided with an adhesive backing on the flat face and a removable cover which protects the adhesive backing until it is desired to use the detachable pocket whereupon the cover is removed and the adhesive backing of the detachable pocket is applied to a supporting surface.

3,747,777
ADJUSTABLE STORAGE RACK
Edward Kane, Millville, N.J., assignor to Kane Manufacturing Company, Millville, N.J.
Filed Sept. 7, 1971, Ser. No. 178,014
Int. Cl. A47f *5/10*, *7/00*
U.S. Cl. 211—176 **7 Claims**



Interconnected supports that include uprights defined by spaced structural channel members in back-to-back relation. Load supporting arms are coupled to the uprights.

3,747,778
SNOWMOBILE HOIST
Emmit L. Collins, Jr., 101 Avis Ct., Pinconning, Mich.
Filed Sept. 8, 1971, Ser. No. 178,700
Int. Cl. B60p *1/00*
U.S. Cl. 214—1 A **9 Claims**

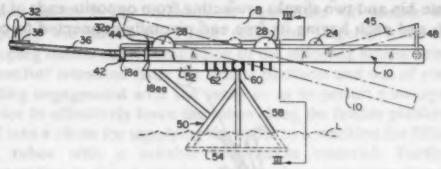


Hoisting apparatus for machines, such as snowmobiles and the like, comprising a frame having vertically, forwardly inclined support rails, a cradle for supporting the front end of a machine slidably mounted on the support rails for movement in a forwardly and upwardly inclined path of travel to a raised position, and a winch mounted on the frame, including a windable cable connectable with the rear end of the machine for lifting the rear end of the machine while simultaneously driving the machine forwardly to move the front end of the machine in the inclined path of travel to the raised position and then swinging the rear end of the vehicle about its forward end to an elevated position.

3,747,779
BOAT RAMP
Paul L. Gross, Apt. 206 Lakeview Towers, Sebring, Fla.
Filed Nov. 4, 1971, Ser. No. 195,559
Int. Cl. B60p *1/04*
U.S. Cl. 214—1 A **5 Claims**

A boat ramp apparatus includes a framework ramp which is pivotable about the support axis provided by a separate portable support frame between an inclined position wherein a boat may be loaded or unloaded and a generally horizontal position wherein the boat may be stored elevated above the water. The support axis is formed by a transverse support bar, which enters between pairs of downwardly projecting rod-like stop

members located along the underside of the ramp. The pivot axis of the ramp may be varied by simply lifting the ramp and



moving it to a new position wherein the support axis engages between a different pair of stop members.

3,747,780

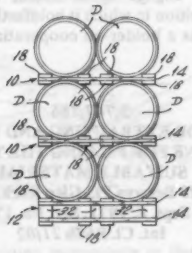
DRUM-SUPPORTING STRUCTURE

Herman H. Schneider, St. Paul, Minn., assignor to Hamm, Theodore, Brewing Co., St. Paul, Minn.

Filed Aug. 26, 1970, Ser. No. 67,171

Int. Cl. B65g *1/14*

U.S. Cl. 214—10.5 R **10 Claims**



A structure for supporting drums such as beer kegs. The drum is adapted to be supported with its axis extending horizontally, and the drum has between its ends a rolling ring. The structure includes a pair of elongated parallel frame members which extend perpendicularly to the drum axis and a pair of elongated parallel drum-engaging members which extend parallel to the drum axis and which extend perpendicularly with respect to the frame members and are fixed thereto. The frame members are spaced at a substantial distance from each other and the drum-engaging members are also spaced at a substantial distance from each other. The pair of drum-engaging members are respectively formed at their inner edges with a pair of aligned notches for receiving the rolling ring of the drum, so that with this construction the pair of drum-engaging members will oppose rolling movement of the drum perpendicularly across the drum-engaging members while the notches will oppose axial movement of the drum in a direction parallel to the drum-engaging members. This structure may form either part of a pallet or part of a spacer to be situated between a pair of drums which are located one above the other.

3,747,781

INDUCTION APPARATUS

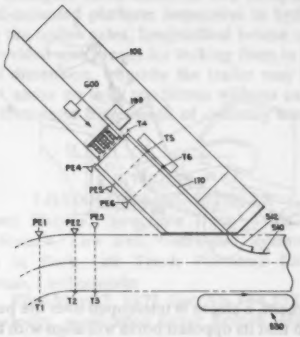
Jack R. Daigle; Mark G. Matthews, and Howard A. Zollinger, all of Grand Rapids, Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.

Filed Apr. 27, 1972, Ser. No. 248,260

Int. Cl. B65g *43/00*

U.S. Cl. 198—76 **12 Claims**

An induction apparatus includes a pair of induction stations having input ends coupled to feed conveyors for transferring articles to the induction stations. Each station includes an induction line extending between an input conveyor and a sorting convyeor and intersecting the sorting conveyor at an acute angle. The induction line of each induction station includes a



powered conveyor, an indexing station and a variable speed feed conveyor controlled to induct cartons onto predetermined trays of the sorting conveyor in a synchronous manner.

3,747,782

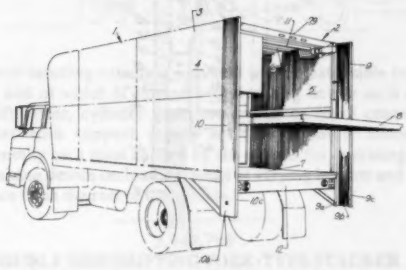
LIFT GATE ASSEMBLY

Donald C. Brown, c/o Brown Welding Shop, Inc., 311 W. South St., Botkins, Ohio

Filed Aug. 2, 1971, Ser. No. 167,976

Int. Cl. B60p *1/44*

U.S. Cl. 214—75 T **7 Claims**



A lift gate assembly for trucks and the like of the type wherein the lift gate is movable between a position wherein it rests on the surface upon which the truck is standing and a position wherein the lift gate is level with the top of the truck body. The assembly comprises a frame having a pair of vertical members joined by an upper crosstie member at the level of the top of the truck body and a lower crosstie member at the level of the truck bed. The vertical members each support a stationary channel, the lift gate is provided at its corners adjacent the truck body with means slidably jointed to the stationary channels. The lift gate is raised and lowered by means of a pair of chains passing over sprockets mounted on a shaft at the top of the frame. Driving means are provided for the shaft and control means are provided for the driving means.

3,747,783

WRECKER SLING PIN LOCK

William T. Long, 3242 M. St. N.W., Washington, D.C.

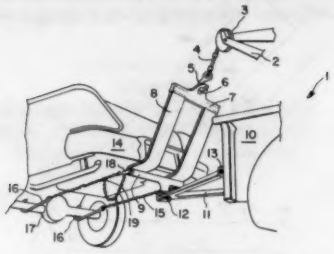
Division of Ser. No. 55,743, July 17, 1970. This application Jan. 28, 1972, Ser. No. 221,768

Int. Cl. B60p *3/12*

U.S. Cl. 214—86 A **4 Claims**

A coupling pin is provided for pivotally securing the lower bracket of a tow truck sling to the tow truck frame to prevent theft, with the coupling pin having a shaft provided with one

or more through diametric bores at one end for reception of a padlock and an enlarged head at the other end. To further make theft difficult by reinforcing the pin and to provide an



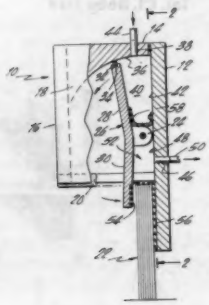
annular abutment, a sleeve is telescoped over the padlock end of the shaft so that its opposed bores will align with the bore of the shaft for common reception of the padlock shackle.

3,747,784

MATERIAL HANDLING SYSTEM

George A. Dean, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Filed Mar. 14, 1972, Ser. No. 234,534
Int. Cl. B66c *1/02*
U.S. Cl. 214—152 5 Claims



An improved material handling system is provided in which a head adapted to lift one or more sheets of material is provided with a pair of plates for engaging both sides of the stack of material to be lifted. One of the plates is movable about a pivot to engage one side of the stack. Means for applying positive pressure to the movable plate on one side of the pivot is provided along with means for applying negative pressure between the plates on the other side of the pivot to both clamp and lift the stacked material.

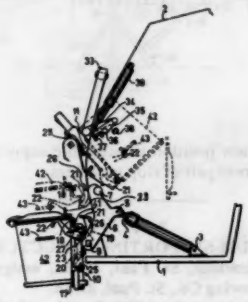
3,747,785

APPARATUS FOR SWINGING UP AND EMPTYING WASTE-BINS OR THE LIKE, WHICH HAVE DIFFERENT SIZE AND POSSIBLY ALSO DIFFERENT SHAPE

Ake Bertil Ingemar Dahlin, Postlada 427, Blomstermala, Sweden

Filed Mar. 27, 1972, Ser. No. 238,345
Claims priority, application Sweden, Apr. 1, 1971, 4230/71
Int. Cl. B65f *3/02*
U.S. Cl. 214—302 9 Claims

An apparatus for swinging up and emptying waste-bins or the like which have different size and possibly also different shape, in a collecting container, includes (a) pivotable support means, which is common to all waste-bins and comprises carrier means having upwardly directed engaging means, adapted to engage a lifting bracket, a flange or the like on the waste-bin from below; and (b) means for holding the waste-bin in an elevated emptying position, substantially upside-down. Said holding means comprises (a) a substantially U-shaped yoke having a web for supporting abutment against one side of the waste-bin and two shanks projecting from opposite ends of the web and each having its free end pivotally connected to one



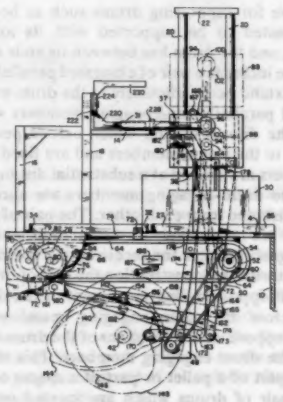
side-wall of the collecting container; and/or (b) clamping means rotatably journalled on said support means in such a way that it may engage an abutment to hereby become brought into a position in which it holdfastly engages a surface of the waste-bin as a holder-on cooperating with said carrier means.

3,747,786

APPARATUS FOR EXTRACTING AND FEEDING TUBES TO A MACHINE FOR FILLING THE TUBES WITH A SUITABLE MATERIAL

August Reichert, 29 Berwyn Pl., Glen Rock, N.J.

Filed Sept. 8, 1971, Ser. No. 178,558
Int. Cl. B65b *21/02*
U.S. Cl. 214—309 9 Claims



A method and apparatus for extracting empty collapsible carton tubes from a transport receptacle in which a transfer assembly is so arranged as to be raised and lowered in operative relation to the receptacle while extractor fingers carried by the assembly are effectively inserted into the tubes upon the lowering of the assembly relative to the receptacle. The extractor fingers include pressure-applying means selectively operable in a positive sense to seize the tubes, the tubes being thereupon withdrawn from the receptacle upon the assembly being vertically raised in relation thereto with the tubes being thereafter projected onto a feeder platform upon the assembly being angularly adjusted to a position extending ninety degrees to the vertical relation. In the latter adjusted position,

the tubes carried by the extractor fingers extend horizontally onto a feeder platform so that upon operation of the pressure-applying means in an opposite negative sense, the tubes are released from the extractor fingers and projected onto the feeder platform by subsequent operation of means for stripping the tubes from the extractor fingers, with the stripping means upon completion of the stripping action being thereafter retracted from the feeder platform and out of contacting engagement with the tubes so as to permit a sweeper device to effectively force the tubes along the feeder platform and into a chute for supplying the tubes to a machine for filling the tubes with a suitable dispensible material. Further cooperating in timed relation with the foregoing operation of the transfer assembly is a stepper mechanism for advancing the receptacle in a step relation to the extraction operation of the extractor fingers so that succeeding rows of tubes in the receptacle may be effectively extracted in succession by the foregoing operation of the extractor fingers.

3,747,787

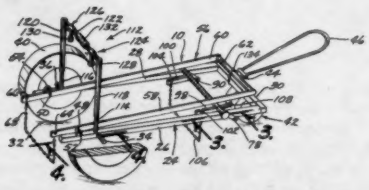
CART FOR TRANSPORTING MONUMENTS OR THE LIKE

Raymond L. Sloan, 2040 N. Cedar, and Harold L. Sloan, 505 N. Wilson, both of Jefferson, Iowa

Filed Mar. 6, 1972, Ser. No. 231,992

Int. Cl. B60p *3/00*

U.S. Cl. 214—390 **10 Claims**



A cart for transporting monuments or the like is disclosed and comprises a horizontally disposed, U-shaped wheeled frame means having an open rearward end. A U-shaped lifting lever assembly is pivotally secured to the frame means adjacent the rearward end thereof for lifting one end of the monument. A second lifting lever assembly is pivotally mounted on the frame means adjacent the forward end thereof for lifting the other end of the monument. A monument stabilizer is provided on the frame means which engages the monument so as to prevent the monument from tipping during the transporting thereof.

3,747,788

METHOD AND MEANS FOR CONSTRUCTING AND TRANSPORTING PRE-FABRICATED HOUSES

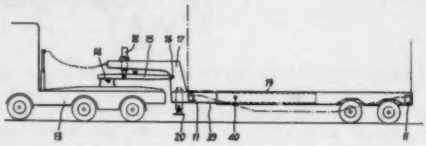
Paul Arsene Jean Gabriel Petetin, 101 Ave. Castermant, 77 Chelles, France

Filed July 13, 1971, Ser. No. 162,146

Claims priority, application France, July 24, 1970, 70.27448

Int. Cl. B60p *1/02*

U.S. Cl. 214—512 **3 Claims**



This invention relates to prefabricated elements of relatively large dimensions, of reinforced or like molded concrete, incorporating all the necessary equipments, appliances and piping and wiring systems, these elements being adapted to be easily connected at the building site to other similar elements and to be constructed at a manufacturing plant and transported by road within the limits of exceptional transport dimensional tolerances. The invention also includes a trailer adapted to transport these elements and comprising to this end a wheel-mounted platform responsive to hydraulic jacks for steering the trailer axles, longitudinal beams of telescopic type and provided with means for locking them in the selected longitudinal dimension, whereby the trailer may be returned to the plant under no-load conditions without exceeding the prescribed transverse dimensions of ordinary transport vehicles.

3,747,789

LOAD HANDLING VEHICLE

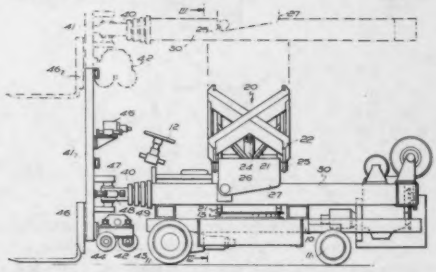
John Robson Shipley, Newcastle Upon Tyne, and Derek Vincent Russell, Low Fell, Gateshead, both of England, assignors to Fork Lift Truck Patentees Establishment, Frurstentum, Liechtenstein

Filed May 17, 1971, Ser. No. 144,172

Claims priority, application Great Britain, May 16, 1970, 23,840/70

Int. Cl. B66f *9/20*

U.S. Cl. 214—671 **3 Claims**



A load handling vehicle is provided with an extensible boom at the end of which is carried a load raising device such as a fork lift tower, cylinder grab, crate grab or small crane jib together with support means and the boom is mounted horizontally on a mast carried by the chassis for operating the load raising device on loading decks at varying heights and at a distance from the rest of the vehicle.

3,747,790

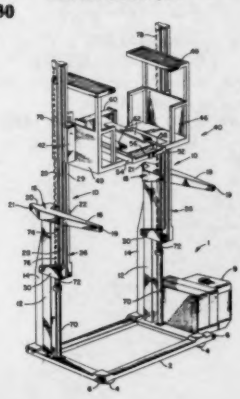
DOUBLE SIDE SHIFTING FORK-TYPE STACKER

Raymond L. Smith, Jr., Southbury, Conn., assignor to C & M Manufacturing Company, Inc., Bethesda, Md.

Filed Mar. 12, 1971, Ser. No. 123,793

Int. Cl. B66f *9/14*

U.S. Cl. 214—730 **16 Claims**



To serve racks on opposite sides of a narrow warehouse aisle, forks are reciprocated horizontally through a fork-sup-

porting head. The head is supported on top of a frame which may be rigid or movable with respect to a vertically moving carriage on a stacker. The head moves across the frame carrying locked forks into and out of the rack. Direction of the forks is changed by moving the head and forks simultaneously in opposite directions. In a preferred form of the invention, the frame on which the head is supported first moves toward the rack and upon sensing the rack enables the driving of the forks into the rack.

3,747,791

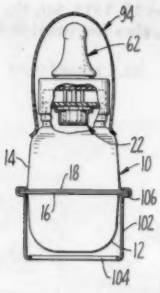
INFANT NURSING DISPENSER

John P. Fouser, 287 Juanita Way, San Francisco, Calif.

Filed Mar. 17, 1971, Ser. No. 125,216

Int. Cl. A61j 9/00

U.S. Cl. 215—11 R **13 Claims**



An infant nursing dispenser and method of manufacturing same. The dispenser includes a body portion, which is at least partially collapsible and includes a fluid outlet having a seal cap affixed thereto. Piercing means is operatively associated with the seal cap and with a relatively movable actuator whereby relative movement between the actuator and piercing means causes said piercing means to break the seal cap when dispensing of the liquid in the body portion is desired. A postive locking arrangement is provided for maintaining the movable actuator and piercing means in fixed relative positions after breaking of the seal cap to insure the free flow of liquid in the body portion through the fluid outlet and a soft, pre-perforated nipple extending upwardly from the actuator. An overwrap is provided to insure the sanitary condition of the nipple prior to its use by an infant. In addition, support means in the form of an open ended tube at least partially surrounds the body portion to protect the body portion and provide a support therefore.

3,747,792

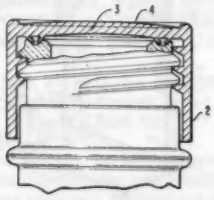
LINERLESS CLOSURE

Eugene Michael Anthony, Muscatine, Iowa, assignor to Darta Industries Inc., Los Angeles, Calif.

Filed Nov. 30, 1971, Ser. No. 203,330

Int. Cl. B65d 53/00

U.S. Cl. 215—40 **6 Claims**



The present invention relates to a unique unitary linerless closure for closuring containers whose neck is provided with a U-shaped groove in the top wall of the container neck, the U-shaped groove having sidewalls which slant outwardly and upwardly at an angle, the closure being provided with substantially circular radially spaced ribs depending from the lower surface of the top portion of the closure, the outer walls of the ribs slanting downwardly and inwardly at the same angle, said ribs being undercut by their inner walls and adapted to sealingly engage the groove when said closure is seated on said container neck.

3,747,793

SAFETY CLOSURES FOR CONTAINERS

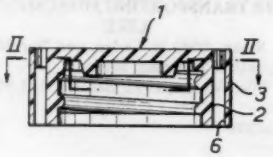
Victor Wassilieff, 84 Rue de l'Assomption, 75 Paris 16eme, France

Filed Feb. 1, 1971, Ser. No. 111,434

Claims priority, application France, Feb. 11, 1970, 7004770

Int. Cl. B65d 41/20

U.S. Cl. 215—42 **12 Claims**



Tamper-proof closure means for a container comprises a stopper and a safety device connected to the stopper by a breakable connection. Co-operating faces or projections on the safety device and the stopper are adapted to push against each other during closing of the stopper, and to move away from each other, so breaking the breakable connection, during opening of the stopper.

3,747,794

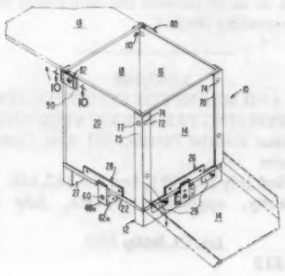
PALLET BOX

Robert H. Bitney, 10649 Morengo Dr., Cupertino, Calif.

Filed June 28, 1971, Ser. No. 157,517

Int. Cl. B65d 9/14, 7/26, 9/24

U.S. Cl. 217—15 **13 Claims**

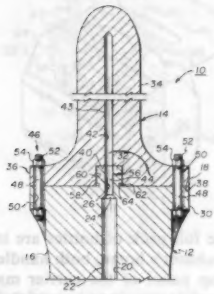


An improved pallet box having four sides hinged to a pallet base in a manner to permit the sides to pivot individually about respective axes near the upper surface of the base. The hinges for the sides allow the sides to be individually raised through a limited distance relative to the base to facilitate the movement of the sides one on top of each other to collapse the box for storage. In their vertical, erected positions, the sides are releasably interconnected and are locked against upward movement relative to the base. One side is pivoted near its upper margin to the pair of adjacent sides so that the one side can pivot in dump-truck fashion.

3,747,795
PRESSURE VESSEL

Irwin Berman, Upper Montclair, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Division of Ser. No. 851,386, Aug. 19, 1969, Pat. No. 3,648,876. This application Dec. 1, 1971, Ser. No. 203,715
Int. Cl. B65d *41/04, 53/00*
U.S. Cl. 220—3 **1 Claim**

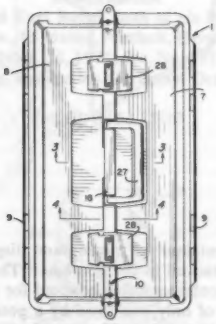


A combined closure and vessel adapted for operation at relatively high pressures is provided with an outer fastening means and an inner means. The location of the means enables the inner means to counteract the bending moment about the outer means.

3,747,796
MOLDED CONTAINER

Joseph W. Kneier, Chesterland, Ohio, and George D. Perkins, Laguna Beach, Calif., assignors to Pendleton Tool Industries, Inc., Los Angeles, Calif.

Filed July 12, 1971, Ser. No. 161,699
Int. Cl. B65d *51/18*
U.S. Cl. 220—29 **4 Claims**

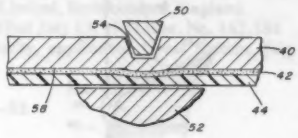


A container such as a fishing tackle box made of molded material and including a base and pair of mating covers hinged to the base and forming the top half of the tackle box. The covers have mating edges including an upwardly opening gutter and a downwardly extending rib that seats in the gutter to aid in holding the covers closed and to prevent water form entering the box. The interlocking edges on the covers enables the tackle box to be lifted without the covers being latched and without them opening.

3,747,797
LAMINATED CONTAINER WALL

Herbert Gayner, Monroeville, and David A. Smith, Penn Hills, both of Pa., assignors to Aluminum Company of America, New Kensington, Pa.

Filed Oct. 19, 1971, Ser. No. 190,559
Int. Cl. B65d *17/20*
U.S. Cl. 220—53 **4 Claims**



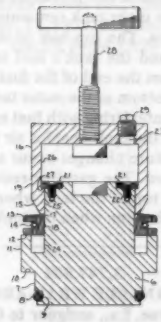
A method of fabricating a laminated metal container wall provided with an opening device including providing a metal sheet having a layer of protective material secured thereto by means of an adhesive selected from the group consisting of epoxy, polyester and polyurethane. The protective material is selected from a group consisting of a copolymer of a polyolefin and ethylene and ionomers of polyolefin. A preferred form of copolymer has polypropylene as the polyolefin employed with the ethylene. A preferred polypropylene ethylene copolymer may have an ethylene content of about 2 to 10 percent. The laminated metal sheet is scored to define a removable sector therein. The scoring is preferably effected to such a depth as to provide residual metal along the score line of about 2 to 6 mils. Simultaneously with the scoring operation, reducing the thickness of the layer of protective material without penetrating entirely through the layer. The protective layer may have an initial thickness of about 1.5 to 4 mils and preferably about 2.5 to 3.5 mils.

A laminated metal container wall having a score line defined removable sector. An adhesive material secured to one surface of the container wall. A continuous layer of protective material secured to the metal panel portion by means of the adhesive. The protective layer may have a thickness of about 1.5 to 4 mils and is selected from a group consisting of a copolymer and a polyolefin and ethylene and ionomers of polyolefins.

3,747,798
PRESSURE VESSEL

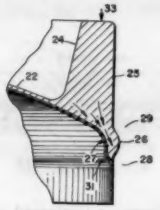
Francis V. Marchal, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Aug. 29, 1972, Ser. No. 284,574
Int. Cl. A47j *27/08*
U.S. Cl. 220—55 Y **4 Claims**



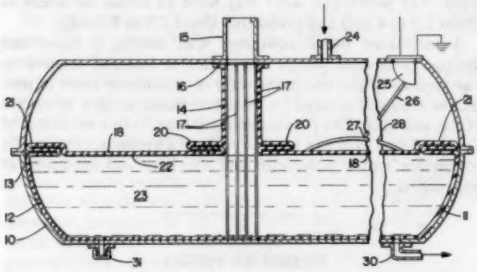
A pressure vessel cover or closure which can be inserted and removed by push or pull forces. Pushing the cover into place cams a segmental ring outward into locking position. Pulling the cover relieves the cam action, allowing retraction of the ring to unlock the cover.

3,747,799
ACID CARBOY
Jerry T. Atkinson, Waukesha, Wis., assignor to Alloy Products Corporation, Waukesha, Wis.
Filed Mar. 18, 1971, Ser. No. 125,535
Int. Cl. B65d 7/42
U.S. Cl. 220—69 **1 Claim**



An acid carboy consisting of a generally cylindrical stainless steel tank having elastomeric skirts at the ends thereof characterized by a novel cross-sectional configuration whereby the carboy can be handled in a variety of ways without substantial damage.

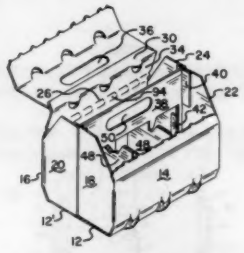
3,747,800
PREVENTING AIR POLLUTION AND IMPROVING SAFETY OF AUTOMOBILE AND SIMILAR TANKS
Clare Kenneth Viland, P.O. Box 284, Bodega Bay, Calif.
Filed Feb. 16, 1971, Ser. No. 115,245
Int. Cl. B65d 25/00
U.S. Cl. 220—85 B **5 Claims**



An evaporation-proof and crash-resistant gasoline tank for automobiles. A flexible light-oil-resistant inner tank has an upper portion above the tank's mid-section acting as a diaphragm and may be tightly attached to the mid-seam that connects the upper and lower halves of a conventional tank, the bottom half of the inner tank remaining in place lining the outer tank at all times. The top half of the inner tank is also tightly attached around the tank's fuel inlet-pipe, and guide rods extend down from the end of the fuel inlet-pipe vertically into the tank to the bottom of the outer tank, to keep the flexible diaphragm from interfering with fuel entering the tank. An air vent at the top of the tank enables air to enter or to be expelled when temperature changes occur and when the tank is being filled or emptied. The gasoline-resistant diaphragm fits against the sides and top of the tank when the tank is full and against the sides and bottom when the tank is empty.

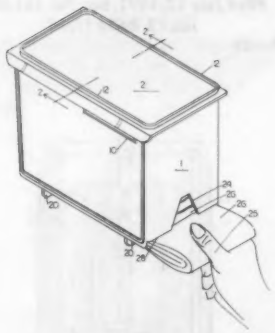
3,747,801
RETURNABLE WRAP-AROUND
Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Sept. 30, 1971, Ser. No. 185,178
Int. Cl. B65d 75/00
U.S. Cl. 220—113 **6 Claims**

A returnable wrap-around carrier for a plurality of objects such as beer bottles or the like of the type wherein the purchaser of the beer bottles places a deposit on the bottles for the return thereof to the storekeeper. The carrier and the bottles contained therein are completely enclosed affording protection to the bottles from light rays and protection from the bottles dropping out of the carrier. The carrier contains a built-in handle formed partly in the top panel of the carrier and partly in the central interior partition formed within the



carrier. When the full pack of bottles are transported in the carrier to the purchaser's home, both handle means are used. Thereafter the top panel of the carrier may be completely removed from the side panels to expose the central partition handle which may be used to return the carrier and the empty bottles to the store for deposit. Thereafter the returned carrier may be used and reused as a simple basket carrier for distribution to other sources.

3,747,802
PORTABLE DISPENSING CONTAINERS
Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Designs, Inc., Cincinnati, Ohio
Filed May 21, 1971, Ser. No. 145,819
Int. Cl. B65d 43/10
U.S. Cl. 221—63 **7 Claims**



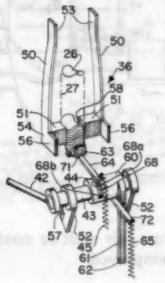
A portable container for storing and dispensing packaged folded articles stacked in the container. The materials when stacked in the container being adapted for removal one at a time by the use of only one hand by a person removing the material from the container. The container can be removably secured to a supporting surface by means of double faced pressure sensitive tape. It is also provided with legs for self supporting the container on any flat surface. In addition, it has slot means for removably securing it to vertical surfaces. A restrictive opening is provided for readily easy removal of a single package of material which, when removed, is replaced in removable position by another package of material in the container. The container has a hinged lid molded integral with the container and the hinge is constructed with spaced slots that prevent a crack or break in any part of the hinge from extending clear across the length of the hinge.

3,747,803

DISPENSER FOR GROUPS OF NESTED ARTICLES

Alfred W. Zoepf, and Charles R. Hood, both of Springfield Township, Hamilton County, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Dec. 23, 1971, Ser. No. 211,266
Int. Cl. B65g 59/06
U.S. Cl. 221—251 9 Claims



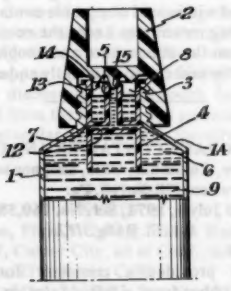
An apparatus for dispensing substantially uniform groups of substantially identical nestable articles from the lower end of a generally vertical stack of nested articles. Clamping means are provided for holding the residuum of a stack of articles in a gravity-feed magazine while the lowermost group of articles is lowered on a support member. Means are provided for synchronizing the operation of the clamping means with the movement of the support member so that the stack is progressively lowered as successive lowermost groups are dispensed from the lower end of said stack. Means are also provided for dislodging the lowermost group from the support member after the group has been lowered far enough to become unnested from the lower end of the residuum of the stack. Further means are provided for unnesting the articles comprising a dispensed group from each other so that they are randomly scattered onto suitable receiving means such as a plate, platter, or the like.

3,747,804

DEVICE AND METHOD FOR SIMULTANEOUSLY DISPENSING DIFFERENT MATERIALS FROM A CONTAINER

Helmut Raaf, and Kurt Buttel, both of c/o Blendax-Werke R. Schneider & Co., 65 Mainz, Postfach, Germany

Filed Oct. 22, 1971, Ser. No. 191,642
Claims priority, application Germany, Oct. 29, 1970, P 20 53 109.3
Int. Cl. B65d 35/22
U.S. Cl. 222—1 12 Claims



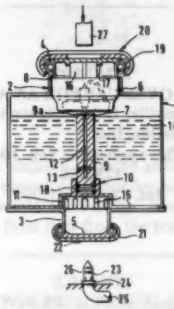
A device for simultaneously dispensing two different paste-like materials from the same container includes an outlet member which communicates with the container interior by means of a main channel leading to one of the materials and a secondary channel extending through the outlet member wall and leading to the other material.

3,747,805

CARTRIDGE FOR DISPENSING LIQUID

Ronald Harvey David Frank Lee, Potten End, Near Berkhamsted, England, assignor to Cooper, McDougall & Robertson Limited, Berkhamsted, England

Filed July 13, 1971, Ser. No. 162,184
Claims priority, application Great Britain, July 30, 1970, 36,820/70
Int. Cl. B67b 7/24
U.S. Cl. 222—82 26 Claims



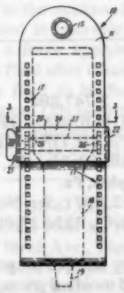
A cartridge suitable for dispensing liquid comprising the combination of a pressure - packed container and an hermetically sealed outer canister pierceable in one area and partially filled with a carrier liquid, said pressure - packed container having an active ingredient dispersed therein and a valve permitting discharge of said active ingredient from said pressure - packed container upon application of force to said valve, said pressure - packed container securely located within said outer canister whereby upon application to said valve of force originating external of said outer canister said active ingredient is discharged from said pressure - packed container into said carrier liquid and egress of said carrier liquid and said active ingredient from said outer canister occurs upon rupture of the one area of said outer canister. There is also provided a method of controlling insects in a closed environment comprising discharging an insecticide into said closed environment from said cartridge.

3,747,806

DISPENSER FOR COLLAPSIBLE TUBES

Harford E. Goings, 5428 Center Dr., Camp Springs, Md.

Filed Nov. 17, 1971, Ser. No. 199,433
Int. Cl. B65d 35/28
U.S. Cl. 222—102 4 Claims



A dispenser for collapsible tubes which includes an elongate flexible plastic support for the collapsible tube which engages

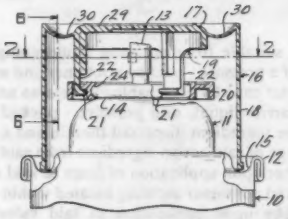
the opposite sides of the tube with the cap and dispensing end of the tube extending through a central aperture therein. The flexible member has rows of generally rectangular apertures formed adjacent the opposite side edges thereof to serve as a rack. A pair of tube squeezing rollers are journaled in a housing adapted to engage over the flexible member with the tube therein. Each of the tube squeezing rollers has a sprocket gear on each end thereof with the gears engaging in the rack on the flexible member. A hand crank on one end of one roller is provided for rotating the roller so that the housing moves downwardly on the flexible member with the rollers squeezing the front and rear of the flexible tube to dispense the contents therefrom.

3,747,807

CHILD-PROOF OVERCAP FOR AN AEROSOL CAN

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

No. 3,706,401. This application Feb. 10, 1972, Ser. No. 225,056
Int. Cl. B67b 5/00
U.S. Cl. 222—153 1 Claim



A child-proof overcap for an aerosol can. The overcap has a cylindrical outer skirt, a circular top and an inner structure depending from the top. The inner structure carries two or more inwardly protruding lugs which are evenly spaced circumferentially. An annular element on the can has a similar number of outwardly extending lug threads adapted to be engaged by the lugs. The lug threads have downwardly extending bottom surfaces leading to upwardly extending undercut recesses in which the lugs on the overcap may be engaged. The top has a resilient annular portion which is deformed by engagement of the lugs with the lug thread recesses in order to retain the lugs in the recesses to restrain relative rotation of the overcap and can.

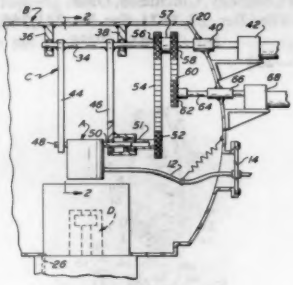
3,747,808

MOLTEN METAL POURING DEVICE HAVING PANTOGRAPH TILTING MECHANISM

Jay Lewis Richman, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 12, 1971, Ser. No. 198,360
Int. Cl. B22d 37/00
U.S. Cl. 222—166 5 Claims

A metallurgical casting furnace for pouring one or a plurality of horizontally spaced molds. System utilizes a cradle which is adapted to arcuately position a crucible for pouring while allowing either horizontal or vertical ingot charging. A pantograph tilting mechanism permits the crucible to be retained in upright position during arcuate displacement and is also adapted to tilt the crucible independently for teeming into one



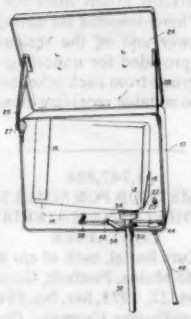
mold at a time. Vacuum, air melt or controlled atmosphere environments may be employed.

3,747,809

CLAMPING MEANS FOR FLEXIBLE DISPENSING CONDUITS

Robert J. Harvey, Ramsey, and Angelo G. D'Imperio, New Milford, both of N.J., assignors to R. J. Harvey Instrument Corporation, Hillsdale, N.J.

Filed Dec. 9, 1970, Ser. No. 96,531
Int. Cl. B67d 3/00
U.S. Cl. 222—183 2 Claims



Disclosed herein is a housing for dispensing purposes provided with a novel dispensing means which allows a disposable container to be inserted into the housing and yet prevents the material contained within said disposable container from leaking. Novel clamping means also keeps the contents within the container free from the atmosphere and enables one to place the container within said clamp efficiently and effectively.

3,747,810

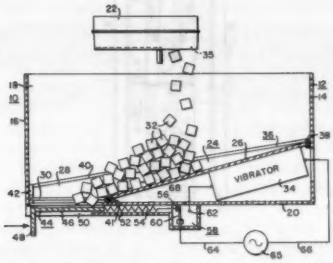
ICE CUBE STORAGE CONTAINER AND DISPENSER

Clarence F. Graser, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 8, 1971, Ser. No. 160,587
Int. Cl. B65g 3/12
U.S. Cl. 222—199 3 Claims

The invention provides a container for storing and dispensing of ice cubes from a refrigerator so that the cubes may be conveniently received in a glass or other portable receptacle. The container is disposed in the freezer section of a refrigerator and includes an inclined chute down which the ice cubes have a tendency to slide. The inclined chute has, at-

tached to its bottom, a vibrator means and also includes a resilient gasket extending around its periphery that attaches it to the walls of the container so that vibrations imparted to it for the delivery of ice down along the chute are isolated from the remainder of the refrigerator. A spring loaded sliding door is provided on the bottom side of the ice storing container,



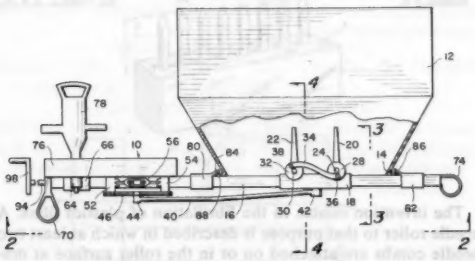
with an opening of the door compressing the spring and urging its remote end against a switch means that activates the vibrator means. Ice cubes then move down along the inclined chute means, being separated from one another by vibrating agitation, and drop downwardly through the opening provided by movement of the sliding door to its inner position.

3,747,811

AGITATOR FOR FACILITATING FLOW FROM HOPPER

Karl D. Lewis, Box 248, Argonia, Kans.; Ray W. Hasselwander, Box 11, Pondcreek, Okla., and William Leon Ammann, Argonia, Kans.

Filed Jan. 25, 1971, Ser. No. 109,497
Int. Cl. G01f *11/00*
U.S. Cl. 222—233 **7 Claims**



An agitating device adapted for being disposed on a container or hopper, such as the hopper of a railroad car, and having movable fingers or prong members extending upwardly through the hopper opening for stirring or agitating the material being discharged therethrough for facilitating the flow of material from the hopper, and particularly for facilitating the flow of granular bulk material therefrom.

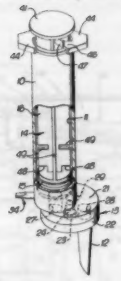
3,747,812

SYRINGE

Harvey Karman, Playa Del Rey; Milton Robins, El Segundo, and Leo Wolf, Culver City, all of Calif., assignors to Medical Concepts, Inc., El Segundo, Calif.

Filed Oct. 21, 1971, Ser. No. 191,512
Int. Cl. B65d *83/00*
U.S. Cl. 222—387 **5 Claims**

A syringe particularly suited for producing and retaining a vacuum and utilizing the vacuum for drawing material into the syringe. A body with a plunger moving therein between piston in and out positions, and means for locking the plunger in the out position to maintain the vacuum and prevent accidental inward movement of the piston and limit outward movement. A plunger shaft with a shear zone for breaking off the shaft



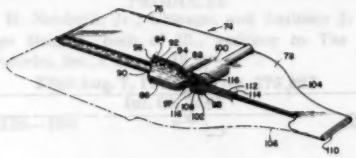
after producing the vacuum. A valve at the inlet and operable between open and closed positions for holding a vacuum and for controlling flow into the syringe. A check valve adjacent the inlet permitting fluid flow from the body.

3,747,813

SYSTEM FOR PROCESSING A STRIP OF PHOTOGRAPHIC MATERIAL

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 788,897, Jan. 3, 1969, Pat. No. 3,644,024.
This application May 17, 1971, Ser. No. 144,223
Int. Cl. B65d *47/10*
U.S. Cl. 222—541 **9 Claims**



A motion picture film processing system employing an applicator having an orifice through which processing fluid may be expressed onto a strip of exposed film as the film is drawn across the face thereof. Processing fluid is initially stored in a collapsible container having a weakened portion adapted to rupture when a predetermined compressive force is applied to the container. An expandable chamber having a restricted exit orifice communicating with the applicator also has an entrance port connected to the weakened portion of the collapsible container. Positioned in operable relationship to the expandable chamber is a force applying member adapted to exert a pressure on the fluid after it has been received into that chamber to cause the fluid to be fed from the expandable chamber to the applicator. This system can advantageously be employed in a compact multipurpose film handling cassette adapted to be mounted in both a camera and a projector.

3,747,814

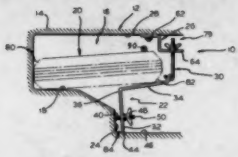
SPARE TIRE CARRIER FOR AUTOMOBILE TRUNKS

Charles C. Briery, 947 Strait Ave., Topeka, Kans.

Filed Aug. 24, 1971, Ser. No. 174,452
Int. Cl. B62d *43/00*
U.S. Cl. 224—42.12 **6 Claims**

A spare tire carrier for automobile trunks of the type having a shelf structure at the back of the trunk including a lower

angle bracket having legs in right angle relation in which one of the legs is loosely received in upright relation over a mounting stud anchored at the base of the trunk shelf structure, with the other leg projecting outwardly of the trunk from the upper end of said one leg, a Z-bracket anchored to the roof of the trunk above the angle bracket and defining an arm projecting outwardly of the trunk and spaced below the trunk roof, and a



J-bolt having its head end removably received in the angle bracket projecting leg and its threaded end extending through the Z-bracket projecting arm and carrying a wing nut to clamp the tire resting on the trunk shelf structure between the lower bracket and the trunk roof or torsion bar, depending on the make or model of the car.

3,747,815

SKI CARRIER

Michael F. Ettl, Rt. 1, P.O. Box 75, Meridan, Calif.

Filed Dec. 6, 1971, Ser. No. 205,124

Int. Cl. B65d *45/24*

U.S. Cl. 224—45 S **3 Claims**

A ski carrier which clamps the opposite edges of the skis with the skis in spaced apart parallel relation. The clamping members are a pair of plates covered with resilient material which engage the edges of the skis and a bolt extends between the plates to clamp the plates together. A handle is secured to the bolt at one end thereof to provide a means for carrying the skis from place to place.

3,747,816

TAPE DISPENSER

Yuen Se-Kit, 97 Main St., Cha Kwo Ling, Kowloon, Hong Kong

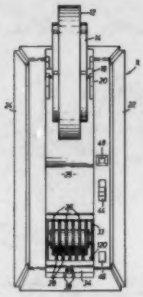
Filed Nov. 18, 1971, Ser. No. 199,960

Claims priority, application Great Britain, May 4, 1971, 13,016/71

Int. Cl. B65h *17/26*; B26f *3/02*

U.S. Cl. 225—11 **13 Claims**

The invention provides a dispenser for adhesive tape comprising a housing for rotatably supporting a reel of adhesive tape, and a feed system to draw tape from the reel and feed it out of the housing, the feed system including a drive motor for a feed roller to which the tape can releasibly adhere. A



manually operable control device can energise the motor, and a press member prevents curling of tape which is dispensed.

3,747,817

NEEDLE ROLLER FOR THE FIBRILLATION OF A SPLITTABLE PLASTICS FILM

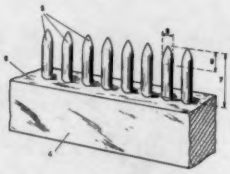
Petrus Theodorus Antonius Klaase, Voorburg, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Filed Sept. 21, 1971, Ser. No. 182,380

Claims priority, application Netherlands, Oct. 8, 1970, 7014809

Int. Cl. B26f *1/20, 3/02*

U.S. Cl. 225—97 **1 Claim**



The invention relates to the fibrillation of plastics films. A needle roller to that purpose is described in which at least two needle combs are attached on or in the roller surface at mutually equal distances, which combs each consist of a row of needles adjacently arranged in a support and provided with torpedo-shaped points lying on one line and parallel to the roller axis, each needle having a diameter of 10 – 75 μm and reaching beyond the support over a length of maximum four times the diameter of the needle.

3,747,818

SYSTEM FOR SCANNING THE LOOP-WARNING BARRIERS OF PNEUMATIC BUFFER CHAMBERS IN MAGNETIC TAPE UNITS

Klaus Winkler, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 22, 1971, Ser. No. 182,745

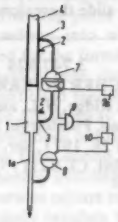
Claims priority, application Germany, Sept. 22, 1970, P 20 46 716.7

Int. Cl. G11b *15/58*

U.S. Cl. 226—1 **4 Claims**

A differential pressure switch is provided in scanning relation to the loop-warning gates or barriers in each pneumatic

dashpot or buffer chamber through which the magnetic tape is looped in the operation of data processing magnetic tape



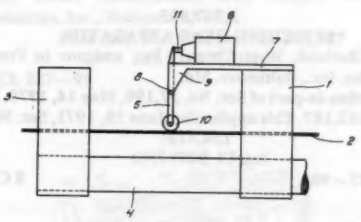
units. In additon a subpressure monitor switch may be provided in the system.

3,747,819

CONTROL DEVICE FOR FEEDING APPARATUS FOR PUNCH PRESSES AND THE LIKE

Seth D. Brandstrom, Nya Vagen 45, 86200 Kvissleby, Sweden

Filed Oct. 7, 1971, Ser. No. 187,382
Claims priority, application Sweden, Nov. 3, 1970, 14799/70
Int. Cl. B65h *25/00*
U.S. Cl. 226—25 5 Claims



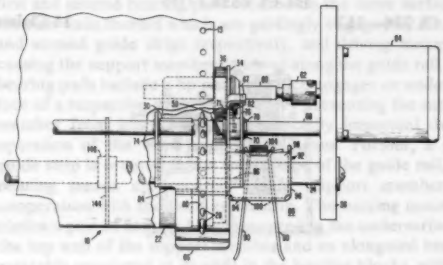
An apparatus for punching and otherwise working metal plates, strips, wire or the like, in which the work piece is advanced by a reciprocating gripping member to a working station in the machine at which position the work piece is gripped and retained by a stationary gripping member, during the return movement of the reciprocating gripping member; the stationary gripping member in turn releasing the work piece upon further advancement of the work piece by the reciprocating gripping member, a control device carried by the reciprocating member and having friction means so adjusted as to slide over the work piece during the return movement of the receiprocating member but effective to stop the machine upon a predetermined relative movement or slippage between the work piece and the reciprocating member during the advancing movement.

3,747,820

FORMS FEEDING DEVICE

John Elmer Hawxhurst, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,603
Int. Cl. G03b *1/24*
U.S. Cl. 226—76 7 Claims



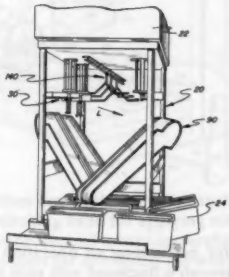
An inexpensive and efficient forms feeding device for a printer utilizes a pair of independent sprocket feed wheels which are quickly adjustable to almost any width form and which are driven from a common drive shaft.

3,747,821

LOADER MECHANISM FOR STRANDS OF LINKED PRODUCTS

William H. Neubeck, Jr., Chicago, and Anthony J. Kloska, Chicago Heights, both of Ill., assignor to The Griffith Laboratories, Inc., Chicago, Ill.

Filed Aug. 7, 1972, Ser. No. 278,193
Int. Cl. B65h
U.S. Cl. 226—104 20 Claims



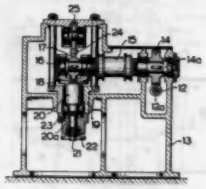
The present invention provides an automatic apparatus which will pick up continuously connected casings of linked product, especially sausages or frankfurters, from an accumulation area or container, align and count a fixed number of links, elevate and rotate this measured quantity of product and then hang a helically looped section upon a hanger which is affixed to a continuously moving conveyor means.

3,747,822

DRIVE MECHANISM FOR THE CLAMPING CARRIAGES OF PEELING MACHINES

Horst Lorenz, Solingen, and Karl Gustav Weck, Solingen-Wald, both of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Jan. 17, 1972, Ser. No. 218,364
Claims priority, application Germany, Feb. 15, 1971, P 21 07 159.0
Int. Cl. B65h 17/36
U.S. Cl. 226—162 11 Claims



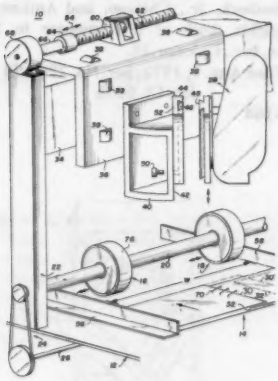
A drive for the clamping carriage of a bar or rod peeler. The drive utilizes opposed driven rollers or the like, which operate in conjunction with a track or rod to effect movement of the carriage between first and second stations.

3,747,823

STITCHING MACHINES

Lauri C. Barland, West Chester, Pa., assignor to Precision Industries, Inc., Baltimore, Md.

Filed Aug. 18, 1971, Ser. No. 172,834
Int. Cl. B27f 7/06
U.S. Cl. 227—99 3 Claims



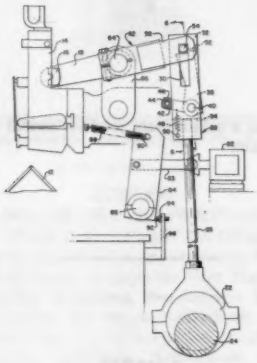
A machine for performing an operation on a work piece passing therethrough is disclosed with such machine including a work surface for supporting the work piece as it passes through the machine; pull roll means for advancing the work piece in a first direction of travel through the machine; and work application means, for example a stitching head, for performing a stitching operation on the work piece, said work application means being selectively movable in a second direction transverse to the first direction of travel of the workpiece. The pull roll means comprises at least one pull roller provided on a pull roll shaft for rotation therewith and slidable motion therealong in the aforementioned second direction of travel of the work application means. The pull roller includes at least first and second unidirectional clutches carried on the shaft with the first unidirectional clutch being capable of rotation on the shaft in one direction and incapable of rotation on the shaft in an opposite direction, and the second unidirectional clutch being capable of rotation on the shaft in the opposite direction and incapable of rotation on the shaft in the one direction. In this manner, the pull roller must rotate with the shaft but may slide therealong.

3,747,824

SIGNATURE STITCHER INTERRUPTER APPARATUS

Gosta R. Linden, Park Ridge, N.J., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed July 28, 1971, Ser. No. 166,732
Int. Cl. B21j 15/28
U.S. Cl. 227—3 3 Claims



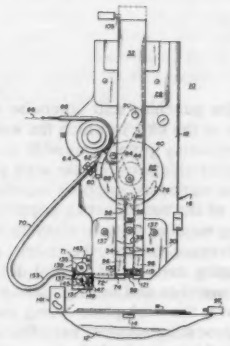
In an apparatus for stitching signatures, an interruptable signature stitching means comprising a drive means operatively connected to an interrupting means which is operatively connected to a stitching head means to selectively actuate said stitching head means, said interrupting means being adapted to selectively interrupt the stitching action of said stitching head means when the thickness of said signatures varies from a predetermined value.

3,747,825

STITCHING HEAD APPARATUS

Lauri C. Barland, West Chester, Pa., assignor to Precision Industries, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 37,190, May 14, 1970, Pat. No. 3,642,187. This application June 18, 1971, Ser. No. 154,418
Int. Cl. B27f 7/02
U.S. Cl. 227—90 8 Claims



A wire stitching head is disclosed for successively producing a series of uniformly shaped and sized stitches from a continu-

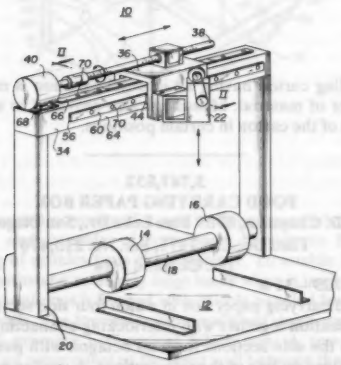
ous length of wire and includes a reciprocating stitch forming bar and a relatively shiftable stitch driving bar operated by a rotating cam wheel provided with an arcuate feeding cam which coacts with a guide roller to feed a predetermined length of wire into stitch forming position upon each rotation of the cam wheel. The stitch forming bar and stitch driving bar are guided in their reciprocating paths of motion by a guide member having a channelway into which the preselected length of wire is positioned for the forming and driving operation. The preselected length of wire, determined by the arcuate length of the aforementioned feeding cam, is just slightly less than the width of the channelway in the guide member whereby such length of wire does not reach the opposite wall in the channelway at any time during the stitch forming or stich driving operation thereby avoiding deflection and bending of the wire which otherwise occurs especially at high speed operation. To more precisely regulate the length of wire fed into stitch forming position, the aforementioned guide roller is mounted on the frame of the apparatus for rotation with the cam wheel and preferably by being geared thereto. Also to aid in positioning the wire in the stitch forming apparatus, a novel wire check structure, comprising a pair of unidirectional clutches between which the wire passes, is mounted immediately adjacent the aforementioned guide member to minimize the distance between the wire check and a passageway in the guide member through which the wire passes to reach the stitch forming position. Additionally, wire guide means are provided which include a hollow tube, a portion thereof being disposed in a curvilinear path which is opposite the direction of the bias established by the supply of wire. In this manner, the natural bias of the wire in the direction of the coil rolls from which it was stored is reversed and the wire is straightened out prior to being fed to the stitch forming portion of the apparatus. Finally, after a stitching cycle has been completed, the deenergization of the driving mechanism of the stitching head apparatus is arranged to take place when the moving parts thereof approach a condition of zero momentum thereby substantially reducing the stresses which must be withstood by such elements as the clutch-brake utilized to halt the motion of the apparatus.

3,747,826

TRAVELING STITCHING HEAD

Stanley Little, Cockeysville, Md., assignor to Precision Industries, Inc., Baltimore, Md.

Filed Oct. 18, 1971, Ser. No. 189,927
Int. Cl. B27f 7/16
U.S. Cl. 227—99 **7 Claims**



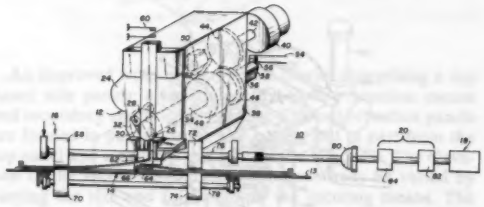
A machine is disclosed for performing an operation on a work piece passing therethrough with the machine including a work surface for supporting the work piece as it passes through the machine, advancing means for advancing the work piece in a first direction of travel through the machine, work application means for performing the operation on the work piece, and moving means spaced from the work surface for selectively moving the work application means in a second direction transverse to the first direction of travel; with the moving means comprising: a guide rail supported above the work surface; first and second guide strips secured to the guide rail on opposite sides thereof; a traveling support member, the application means being carried by the traveling support member, with the traveling support member including first and second bearing pads secured on the inner surface of the side walls thereof which are guidingly engaged by the first and second guide strips respectively, and driving means for causing the support member to travel along the guide rail. The bearing pads include a lip portion which engages an undersurface of a respective guide strip thereby preventing the support member from lifting, which is especially important during operation of the work application means. Further, a third guide strip is secured to the top surface of the guide rail, and bearing means are secured to the support member for cooperation with the third guide strip. The bearing means includes a pair of bearing blocks secured to the undersurface of the top wall of the support member and an elongated bearing rotatably supported at its ends in the bearing blocks, with the bearing rolling along the third guide strip as the support member travels along the guide rail. The bearing includes a pair of larger diametered flanges spaced apart by a distance corresponding to the width of the third guide strip whereby lateral movement of the support member is prevented. Preferably, all of the guide strips, and the bearing blocks are removably secured to their respective members to permit replacement.

3,747,827

ELECTRONICALLY CONTROLLED STITCHING MACHINE

Stephen Stanton, Baltimore; Edward Varholy, Glen Burnie, and William Verwey, Phoenix, all of Md., assignors to Precision Industries, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 72,764, Sept. 16, 1970, Pat. No. 3,664,564. This application Feb. 2, 1972, Ser. No. 222,869
Int. Cl. B27f 7/06
U.S. Cl. 227—100 **24 Claims**



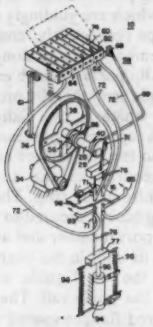
Stitching machines are disclosed which include first means in the form of a stitching head for applying stitches to a work piece passing thereby; second means preferably in the form of cooperating pull rollers for conveying the work piece past the stitching head; a motor selectively connectable to the pull rollers for the operation thereof; interconnection means in the form of a clutch-brake combination responsive to preselected operating signals for selectively connecting and disconnecting the motor to the pull rollers to thereby effectuate incremental indexing of the work piece past the stitching head; and electronic control means for generating the preselected operating signals necessary to effectuate the incremental advance of the work piece through the machine. Three embodiments are shown in which the operation of the stitching head is coordinated with the operation of the clutch-brake combination in different ways.

3,747,828

FASTENER ATTACHING MACHINE

Donald E. Dupee, and William S. Hodgson, both of Hingham, Mass., assignors to South Shore Machine Co., Inc., Braintree, Mass.

Filed Mar. 18, 1971, Ser. No. 125,753
Int. Cl. B27f 7/02
U.S. Cl. 227—112 **5 Claims**



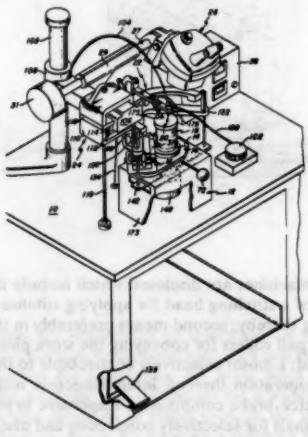
An improved fastener attaching machine comprising a number of oppositely disposed jaw carriers having gravity and vacuum actuated fastener feed ducts leading from a central hopper for feeding fasteners and pre-positioning them for subsequent driving into opposed sides of an article disposed between the jaw carriers.

3,747,829

SEMICONDUCTOR LEAD BONDING MACHINE

Lucien A. Hofmeister, Mountain View, Calif., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 869,745, Oct. 27, 1969, abandoned. This application Dec. 13, 1971, Ser. No. 207,666
Int. Cl. B23k 27/00, 29/00
U.S. Cl. 228—29 **17 Claims**



A machine for bonding a series of prearranged elements such as connector pads of circuit portions of semiconductor devices to other allied circuits and comprising a bonding tool adapted to overlie the elements, and means for moving the tool successively into sequential pressure contact with the elements and in a path having a spiral configuration to effect the bonding in an improved and more efficient manner.

3,747,830

COLLAPSIBLE SYNTHETIC RESINOUS DISPLAY CONTAINER

Yehuda Goldman, 509 Fifth Ave., New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,845
Int. Cl. B65d 3/04
U.S. Cl. 229—21 **2 Claims**

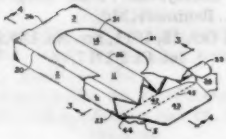
A collapsible tubular display container formed of at least one sheet of planar flexible synthetic resinous material heat sealed along the longitudinal edges thereof to form a flexible tubular body. Bead-forming synthetic resinous means is heat sealed to the continuous end edges formed thereby. Planar end wall members are pushed against the bead-forming means to be resiliently and frictionally retained thereby. One of said end walls may be provided with cord means passing through the plane thereof to assist in closing the device, and subsequently serve as a carrying means.

3,747,831

FOLDING CARTON WITH PARTITION AND BLANK THEREFOR

Wallace E. Hanson, Springfield, Mass., assignor to Champion International Corporation, Knightsbridge, Hamilton, Ohio

Filed May 23, 1972, Ser. No. 256,079
Int. Cl. B65d 5/50
U.S. Cl. 229—27 **10 Claims**



A folding carton having an internal partition is made from one piece of material. Means are also provided to secure the contents of the carton in certain positions.

3,747,832

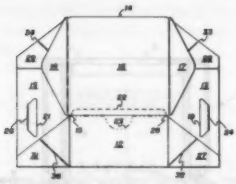
FOOD CARRYING PAPER BOX

Richard D. Chapman, 8789 Blue Lake Dr., San Diego, Calif.

Filed Dec. 29, 1971, Ser. No. 213,470
Int. Cl. B65d 5/24
U.S. Cl. 229—31 R **1 Claim**

A food carrying paper box in which four side sections and a bottom section together with interlocking connecting sections between the side sections form an octagon with punched out lock sections on two of the side sections. A section contiguous with one of the side sections which forms a top section of the box and has rounded locking tabs extending therefrom on two of the sides for cooperation with the lock sections. The edge of the top section opposite the edge contiguous with an edge of one of the side sections is attached to the opposite edge of an opposite side section by a glue flap which is perforated for

removal of the top section upon opening the box. The entire top section including the rounded locking tabs being folded



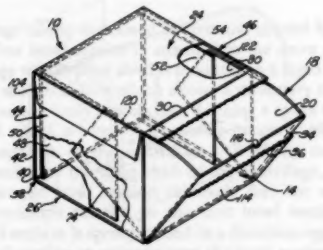
underneath sections forming the octagon resulting in a convenient place mat.

3,747,833

STACKABLE DISPENSER CONTAINER

Henry G. Robinson, Olmsted Falls, Ohio, assignor to Lamson & Sessions Co., Cleveland, Ohio

Filed Oct. 13, 1971, Ser. No. 188,978
Int. Cl. B65d *5/72, 5/54*
U.S. Cl. 229—17 10 Claims



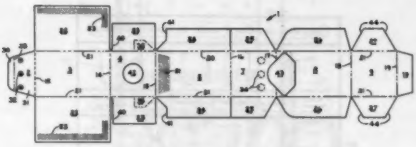
An improved container for use in shipping articles is both stackable and capable of forming a hopper to facilitate dispensing of articles from the container. To enable the container to withstand relatively large loads when it is placed in a stack, the container is formed with double paneled front, rear, and side walls. The top and bottom walls are single paneled or layered to promote economical fabrication. A tear strip is formed in an outer panel of the front wall between the top and bottom walls. This tear strip can be removed or torn away to sever the outer panel and release the inner panel of the front wall for outward pivoting movement to form the hopper. The container can withstand a relatively heavy load even when the front wall is pivoted outwardly due to the strength which is provided by the double paneled rear and side walls.

3,747,834

ONE PIECE FOLDING CARTON WITH DRAWER

Joseph F. Schillinger, Palos Hills, Ill., assignor to Champion International Corporation, Knightsbridge, Hamilton, England

Filed Mar. 14, 1972, Ser. No. 234,529
Int. Cl. B65d *5/38*
U.S. Cl. 229—20 6 Claims



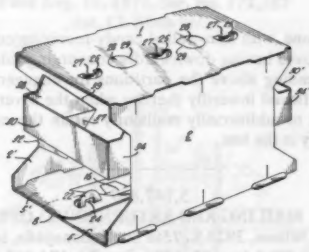
A one piece folding carton and blank therefor provide a container formed to provide a drawer which can be moved in and out of the container and is integral therewith.

3,747,835

WRAP-AROUND ARTICLE CARRIER WITH SECONDARY RETENTION END PANELS

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Continuation-in-part of Ser. No. 15,408, March 2, 1970, abandoned. This application Dec. 21, 1971, Ser. No. 210,529
Int. Cl. B65d *5/02, 75/00*
U.S. Cl. 229—40 6 Claims



An improved wrap-around article carrier comprising a top panel; side panels; a bottom panel; primary retention means and secondary end retention panels. The end retention panels are formed in part from the side panels and in part from the top panel and are suitably secured to the side walls. The elevation of the secondary end retention panel may be varied by varying the size and fold angle of the securing means. The secondary end retention panel serves as a secondary means of retaining the articles in the carrier when the primary retention means fails.

3,747,836

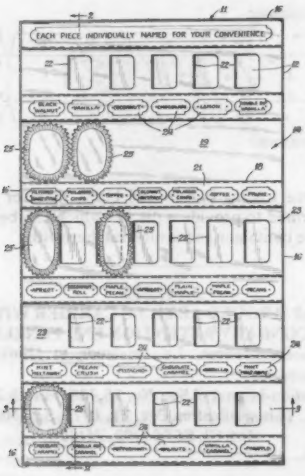
CANDY BOX

William Howlett, c/o Horton, Davis, McCaleb & Lucas, Suite 2040, 230 W. Monroe St., Chicago, Ill.

Filed Mar. 23, 1972, Ser. No. 237,290
Int. Cl. B65d *3/24, 85/00*
U.S. Cl. 229—42 3 Claims

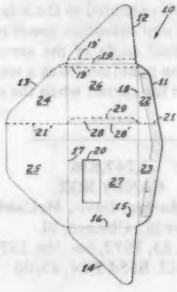
Candy box with one-piece liner forming a plurality of transversely extending grooves and partitions having upper horizontal and transversely extending surfaces defining longitudinal margins along the grooves, a plurality of dividers in at least some of the grooves integral with the liner and spaced transversely to define with the groove walls a plurality of cells each adapted to receive at least one piece of a particular type of candy, indicia means on the upper horizontal surfaces in-

dividual to each cell to identify a particular type of candy, a box bottom housing the liner having marginal walls extending a predetermined distance above the horizontal partition surfaces, a cover, and a resilient pad having a thickness substantially equal to said predetermined distance for filling the space between the cover and the marginal walls of the bottom above



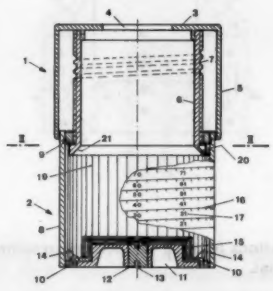
the partitions, with thin-walled candy-receiving cup members in the grooves having downwardly converging side walls normally extending above the partitions for engagement by the pad to be flexed inwardly thereby when the several parts are assembled to additionally resiliently retain the candy pieces protectedly in the box.

3,747,837
MAILING AND RETURN ENVELOPE
Donald G. Wilson, 3921 E. 75th St., Indianapolis, Ind.
Filed Aug. 25, 1971, Ser. No. 174,663
Int. Cl. B65d 27/06
U.S. Cl. 229—73 R **1 Claim**



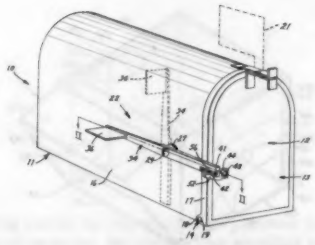
An envelope which may be mailed twice. The envelope is perforated or lined so as to allow it to be separable into two separate portions. One of the portions is provided with adhesive adjacent to the perforation or line so as to facilitate resealing of one of the portions. One embodiment is provided with a foldable tab having the adhesive thereon.

3,747,838
MONEY BOX
Peter Ackeret, Zurich, Switzerland, assignor to Provalor A.G., Lenzerheide, Switzerland
Filed Jan. 3, 1972, Ser. No. 215,026
Int. Cl. A47g 29/00
U.S. Cl. 232—4 R **5 Claims**



A money box with hollow telescoping container members threaded onto each other and one member having a helical scale with the same pitch as the pitch of the interconnecting thread, and scale numbers on the threads with decimal divisions around the periphery of the helical scale, and numbers differing by the value 10 being disposed in axial aligned and superposed relation with each other.

3,747,839
MAILBOX SIGNAL
Paul S. Morton, 82 Mandalay, Kalamazoo, Mich.
Filed Nov. 11, 1971, Ser. No. 197,698
Int. Cl. A47g 29/12
U.S. Cl. 232—35 **5 Claims**



A signaling device for use in combination with a mailbox. The signaling device comprises a mounting bracket secured to one of the sidewalls of the mailbox and includes a shaft extending outwardly from the mailbox with a portion of the exterior surface of the shaft defining a cylindrical bearing surface. A signal flag comprises an elongated arm having an opening therethrough intermediate the opposite longitudinal ends and adapted to receive the bearing surface of the shaft which thereby pivotally supports the elongated arm. A flat, flaglike projection extends outwardly from the arm adjacent one end and a counter weight is secured to the arm at the opposite end. A slot is provided in the arm adjacent the counter weight and extends parallel to the longitudinal axis of the arm and opens outwardly at one end thereof. A latch is secured to the door of the mailbox and projects outwardly laterally of the door. A lug is mounted on the latch and is positioned to be received in the slot to hold the arm in a generally horizontal

position when the door is closed. The lug is movable longitudinally out of the slot through the outwardly open end when the door is opened to release the opposite end of the arm to effect a swinging of the elongated arm to a generally vertical position.

3,747,840

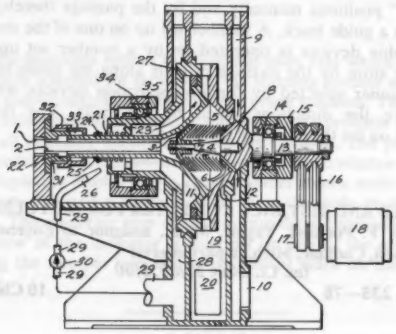
CENTRIFUGE WITH BOWL VALVE CONTROL

Carl W. Weiland, 2980 Interlaken, Orchard Lake, Mich.

Filed Dec. 29, 1970, Ser. No. 102,496

Int. Cl. B04b *11/00*

U.S. Cl. 233—20 R **3 Claims**



A centrifuge cavity is defined by first and second bowl sections. The first bowl section is attached to the drive shaft for the centrifuge which drive shaft is mounted in a main bearing. The second shaft is hollow which allows a stationary inlet pipe mounted concentrically therein thus defining a space with said hollow shaft which is blocked by sealing means to allow high pressure operation of the centrifuge. All of the centrifuge discs are carried by the main shaft of the centrifuge, so as to leave the second bowl section relatively free for easy and precise movements relative to the first bowl section. The second bowl section is spring loaded in a direction opposite to the first bowl section in order to urge the bowl sections apart, thus allowing sludge build-up at the periphery of the centrifuge cavity to escape. Opposing the force of the spring is a source of fluid under pressure which is directed at the side of the second section which is opposite to the first section so as to urge the bowl sections into mated, closed positions when the pressure of the fluid is sufficiently high to ovecome the force of the spring.

3,747,841

SPIN CONTROL FOR CENTRIFUGAL EXTRACTOR

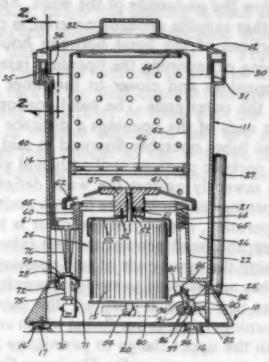
Frank E. Ross, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Nov. 29, 1971, Ser. No. 202,796

Int. Cl. B04b *9/02*

U.S. Cl. 233—24 **12 Claims**

An access lid of a centrifugal extractor is manually movable for interrupting motor energizaton and for effecting engagement of a brake with a surface of the rotatable fabric container to reduce the speed of the spinning container responsive to initial movement of the lid from an access-closing position.



3,747,842

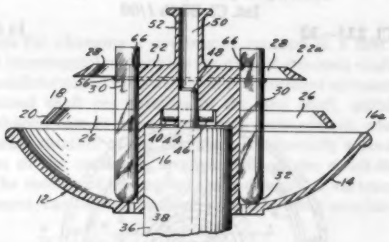
CENTRIFUGE ROTOR WITH SAMPLE HOLDING MEANS

John J. Grubb, La Habra, and Keichi Tomei, Monterey Park, both of Calif., assignors to Hamilton Company, Whittier, Calif.

Filed Aug. 16, 1971, Ser. No. 172,157

Int. Cl. B04b *9/12*

U.S. Cl. 233—26 **8 Claims**



A centrifuge rotor having a hollow concave bowl with a large axial column extending upwardly above a plane of the rim of the bowl and on which there is axially disposed a flange of smaller diameter than the diameter of the rim of the bowl and spaced upwardly of the plane of said rim, the flange having a plurality of annularly-arranged and spaced, radially-extending, elongated or oval-shaped openings. Spaced above said flange is a second and smaller flange axially carried by said column and also having a plurality of radially-extending, annularly-arranged and spaced, elongated or oval openings aligned with respective oval openings of the larger lower flange.

The column is hollow and has a large recess in the lower portion with a reduced diameter recessed part extending upwardly from the upper end of said large recess. At the upper end of the reduced diameter part of the recess a pair of walls extend laterally apart to provide space for reception of a cross pin of an upstanding centrifuge drive shaft, there being a bore extending upwardly from the upper end of the reduced diameter part of the recess and through an upstanding axial stem for stabilizing reception of a part of the drive shaft above the cross pin.

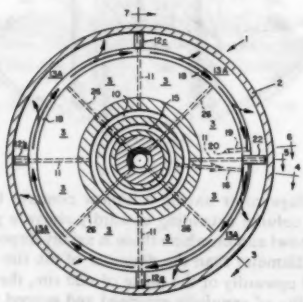
The oval openings in the flanges are adapted to operably receive test tubes therein and the webs between every other opening in the smaller, upper flange have a hook with a part embedded in the webs and an arm facing radially outwardly and spaced below the underside of the webs. An elastic band of rubber, or other suitable resilient material, is carried by the hooks, the portions of the band between hooks extending across or crossing or spanning the openings intermediate the ends of said openings and closer to the inner ends of said openings than the outer ends. The band portions are spaced from the inner ends of the openings a distance less than the diameter of test tubes operably disposed in said openings, so that said band parts or portions resiliently and yieldingly urge the test tubes inwardly against the walls defining the inner ends of said openings and hold same in such position when the rotor is not operating, even when the rotor is turned upside down. However, the band permits the test tubes to pivot on the walls defining the inner ends of said openings. The lower part of said tubes are adapted to swing outwardly by centrifugal force when the rotor is rotated, the tubes extending through the openings in the lower flange which are longer than the openings in the upper flange to permit the lower part of such tubes to be thrown outwardly. The lower flange has a depending flange which limits upward movement of the test tubes when the device is operably rotated and the bowl prevents the test tubes from being thrown out of the device. The band portions or parts that cross or span the openings in the upper flange are spaced from the inner end walls of the openings a sufficient distance to permit the test tubes to be easily flipped into the inner portions of the openings of said upper flange but said test tubes are held within said openings, even when the device is inverted.

3,747,843

CONTINUOUS FLOW ZONAL ROTOR

John E. Joyce, South Weymouth, Mass., assignor to Damon Corporation, Needham, Mass.

Filed Apr. 9, 1971, Ser. No. 132,663
Int. Cl. B04b *1/00*
U.S. Cl. 233—32 **11 Claims**



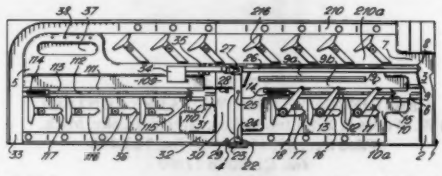
A method and apparatus for continuous flow centrifugation wherein a sample is introduced through the top surface of a rotor core into a sample zone adjacent a gradient zone so that the sample passes substantially 360° and a sample gradient is formed in said gradient zone. The spent sample is removed through the bottom surface of said rotor core, and the sample gradient is removed after separation by introducing a liquid gradient through the top surface of the rotor core to the gradient zone to displace the sample gradient radially inward. The sample gradient is passed out of the core while the rotor is spinning through a passage at the core axis at a reduced pressure in the passage. Since only one liquid stream enters or exits at or near the core axis, the possibility of sample product contamination is eliminated.

3,747,844

COMPUTING APPARATUS

Phillip Robert Vassar Youngman, c/o Faculty of Technology, Open University, Milton Keynes, Bucks, England

Filed Nov. 11, 1971, Ser. No. 197,841
Claims priority, application Great Britain, Nov. 11, 1970, 53,755/70
Int. Cl. G06c *1/00*
U.S. Cl. 235—68 **16 Claims**



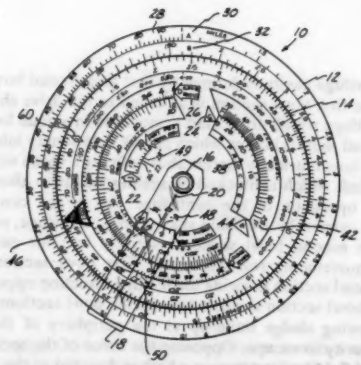
A mechanical digital computing apparatus has three banks of bistable devices, each device being movable between "0" and "1" positions manually and by the passage thereby of balls on a guide track. A number set up on one of the stores of bistable devices is operated on by a number set up on another store by the passage of balls along the guide track in a manner selected by function selection devices which influence the directions taken by the balls. The result appears on the third bank of bistable devices.

3,747,845

SPEED AND DISTANCE COMPUTER FOR BICYCLES

Salvador F. Portuesi, Taylor, Mich., assignor to Eugene G. Portuesi, Cadillac, Mich.; a part interest

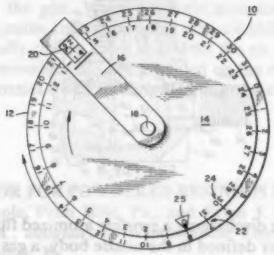
Int. Cl. G06c *27/00, 3/00*
U.S. Cl. 235—78 **10 Claims**



A computer for calculating the speed and distance traveled by a bicycle. The computer comprises a circular base plate having an angularly spaced integers forming concentric scales representative of the bicycle speed, gear ratio, number of sprocket teeth and the distance traversed by the bicycle per crank revolution. A circular member pivotally carried by the circular base plate has angularly spaced integers forming concentric scales representative of the number of teeth in the bicycle chain wheel, the crank revolutions per minute, the time enroute and selected bicycle wheel diameters. The circular member has a plurality of arcuate transparent portions overlying portions of the scales located on the base plate with portions of the circular members' scales extending along side

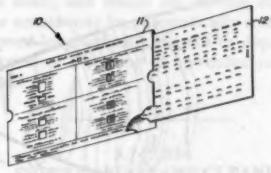
the arcuate portions and adapted to register with the base plate scales to provide the desired calculations.

3,747,846
ELEMENTARY CIRCULAR SLIDE RULE
William C. Long, 6415 Indigo, Houston, Tex.
Filed July 8, 1971, Ser. No. 160,642
Int. Cl. G06g *1/08*; G09b *19/02*
U.S. Cl. 235—84 **3 Claims**



This invention relates to a circular slide rule which is particularly adapted for facilitating the learning process of addition and/or subtraction by primary grade students. The slide rule includes a bottom disc, a top disc, and a problem indicator, all coaxially mounted for relative rotation. The problem indicator, in a preferred embodiment, defines a window which is adapted to display only a single number from a scale on the bottom disc and a single number from the scale on the top disc. The algebraic sum of the two numbers displayed in the window of the indicator is read off on one of the scales as being the number opposite to an answer mark on the other scale.

3,747,847
SLIDE RULE GUIDE TO INTRAVENOUS THERAPY
Melvin L. Cohen, Phoenix, Ariz., assignor to St. Joseph's Hospital and Medical Center, Phoenix, Ariz.
Filed June 28, 1972, Ser. No. 267,189
Int. Cl. G06c *3/00*; G06g *1/02*
U.S. Cl. 235—85 **7 Claims**



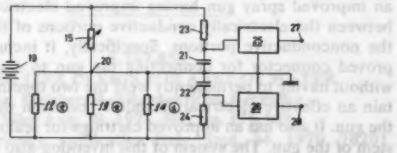
This specification discloses a slide rule guide intended for use in intravenous therapy to aid a doctor or nurse in determining the character and quantities of materials to be injected into a patient's vein and the intervals between such injections as determined by the weight and condition of the patient. The guide consists essentially of an envelope providing two outer panels and a slide in said envelope presenting two effective faces. One of the panels is formed with a small opening with which is associated the designation "Body Weight", while one face of the insert displays a series of figures corresponding to weights of patients and any one of which may appear in said opening. The exposed face of each outer panel is divided into four rectangular sections. Each of these sections on one face is formed with an opening for body weight designation and the face of the slide, opposite to that mentioned above, carries four series of figures for weight designation, each of which cooperates with one of the openings in this panel.

Each section of each outer panel displays the heading for patient condition. Below this heading in each section are two windows in vertical alignment. Associated with one of these windows is a table for "Estimated 24 Hr. Therapy" and associated with the other window is a table for "Treatment Guide". Each face of the slide displays four groups of figures, each comprising a plurality of rows with the figures in the several rows in vertical alignment and any such vertically aligned figures may appear in the windows of a respective panel when the slide is moved relative to the envelope.

3,747,848
INCREMENTAL ROTATIONAL DRIVE
David C. Stothart, Cheswick, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Nov. 26, 1971, Ser. No. 202,266
Int. Cl. B67d *5/22*
U.S. Cl. 235—94 R **14 Claims**

Means for changing a continuous rotation at a first shaft into an incremental or stepping rotation of a second shaft with some predetermined ratio of length of increment of rotation of the second shaft per rotation of the first shaft, utilizing a scroll-shaped cam to drive a racheting arrangement, whereby any partial rotation of the first shaft is inherently stored as a position of the racheting arrangement on the scroll-shaped cam. The motion of the second shaft, directly or via transmission means, can be used to drive some operating member.

3,747,849
CONTROL DEVICE FOR A HEATING INSTALLATION
Werner Heierli, Chemin de Gravenau 1, 1580 Avenches, Switzerland
Filed May 1, 1972, Ser. No. 249,409
Claims priority, application Switzerland, May 14, 1971, 7141/71
Int. Cl. G05b *11/32*
U.S. Cl. 236—91 **6 Claims**



A control device for a heating installation incorporating mechanism for influencing the temperature of a heat carrier, the control device possessing temperature-dependent resistors

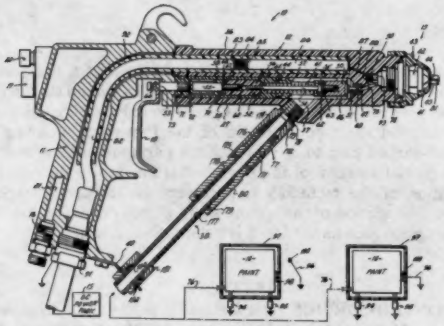
for sensing the external temperature, the room temperature and the temperature of the heat carrier of a room or area to be heated. The invention contemplates the provision of at least one voltage divider embodying an adjustable resistor and the temperature-dependent resistors which are connected in parallel to one another. Two charging capacitors each having associated therewith a charging resistor are also provided, one charging capacitor being electrically coupled with that partial voltage of the voltage divider which increases during increase of at least one of the aforementioned temperatures, and the other charging capacitor being electrically coupled with that partial voltage of the voltage divider which increases during decrease of at least one of the aforementioned temperatures. There is also associated with each charging capacitor a respective pulse generating device for producing a pulse when the charging voltage has reached a certain value and at which time the charging capacitor simultaneously discharges, this pulse being employed for controlling the aforesaid mechanism for influencing the temperature of the heat carrier.

3,747,850

ELECTROSTATIC SPRAY GUN

Donald R. Hastings; Don R. Scarbrough, both of Elyria; Simon Z. Tamny, Lorain, and Frederick R. Wilhelm, Avon Lake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Nov. 16, 1971, Ser. No. 199,114
Int. Cl. B05b 5/02
U.S. Cl. 239—3 **16 Claims**



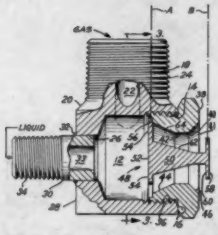
An electrostatic spray system operable to spray either electrically conductive materials or nonconductive materials. The system includes apparatus for mechanically atomizing the coating material and for electrostatically charging it prior to deposition onto an article, which apparatus is characterized by an improved spray gun having improved electrical isolation between the electrically conductive portions of the gun and the nonconductive portions. Specifically, it includes an improved connector for connecting the gun to a supply hose without having to permanently weld the two together to maintain an effective electrical "standoff" between the hose and the gun. It also has an improved cartridge for sealing the valve stem of the gun. The system of this invention also includes an improved material storage tank and insulative system for isolating that tank from ground when the system is used to spray electrically conductive materials. It also includes a grounding wire for connecting the tank to ground when the tank is used to spray nonconductive materials.

3,747,851

SWIRL AIR NOZZLE

Sherman E. Conrad, Des Moines, Iowa, assignor to Delavan Manufacturing Co., West Des Moines, Iowa

Division of Ser. No. 193,023, Oct. 27, 1971, Pat. No. 3,693,886. This application Apr. 27, 1972, Ser. No. 248,335
Int. Cl. B05b 7/10, 1/26, 7/04
U.S. Cl. 239—8 **3 Claims**



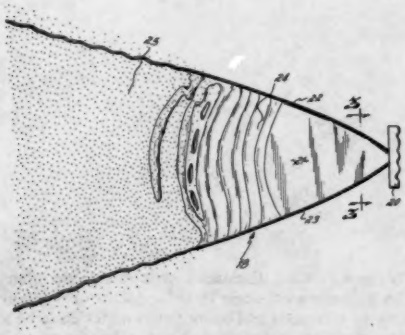
A nozzle for discharging a swirling atomized fluid includes a vortex chamber defined in the nozzle body, a gas inlet tangentially communicating with the chamber and a liquid inlet axially communicating with the chamber wherein the liquid is mixed with the swirling gas in the chamber. An impingement member is positioned in the path of fluid flowing from the chamber having a primary impact surface in the chamber upon which the swirling mixture impinges and a secondary impact surface adjacent to, but spaced from, the nozzle discharge opening upon which the swirling mixture also impinges as it is being discharged from the nozzle.

3,747,852

PAINT SPRAYING METHOD

Eric T. Nord, Oberlin; Samuel R. Rosen, Lorain; Don R. Scarbrough, Elyria; Burton J. Vilcgi, Amherst, all of Ohio, and Peter W. Runstadler, Jr., Hanover, N.J., assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 23,227, March 27, 1970, Pat. No. 3,635,400. This application Sept. 2, 1971, Ser. No. 177,432
Int. Cl. A01n 17/02; A62c 1/12
U.S. Cl. 239—8 **37 Claims**



A method and apparatus for spraying paint and similar coatings. In one form the paint is sprayed at low pressure from a flat fan nozzle. A flat fan of air impinges upon the fan of paint at an angle of from 30°–70°. The air atomizes the paint to form a soft spray with low forward velocity. In another form of the method, two fans of paint are projected toward one another at an angle and an air fan is directed along the bisector toward the zone of intersection. The air fan atomizes both streams of paint. An electrode can be placed in the air stream to ionize the air stream which in turn charges the paint parti-

cles. The width of the paint spray pattern is varied by varying the included angle of the air fan.

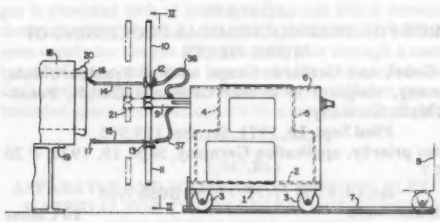
A spray gun is disclosed having two tubular paint nozzles for projecting two fan-shaped fans of paint. An air nozzle is mounted between the paint nozzles for projecting a fan of air against the paint fans to atomize the paint. The air nozzle is adjustable to provide air fans of different angles for varying the width of the paint spray pattern. An electrode is disposed in the air nozzle for ionizing the air stream. This electrode is energized through a resistor and flexible cable. The cable is spring-urged toward the resistor so that when the resistor is removed, the cable shifts causing a safety switch to open deenergizing the gun. When a nozzle mounting member is removed, the cable and surrounding tube are shifted forwardly to automatically close a valve to seal off the air and electrical conduits. Removable caps are provided on the ends of the tubular paint nozzles for facilitating cleaning of the nozzles.

3,747,853

APPLICATOR FOR POWDERED RESINOUS MATERIAL

Harry P. Kipple, Penn Hills, Pa., and Brian J. Sturman, Jr., Atlanta, Ga., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1971, Ser. No. 143,034
Int. Cl. B05b *3/18*
U.S. Cl. 239—187 9 Claims



An automatic device for spraying powdered resin onto coils of a motor or similar electrical devices comprising a shaft that is rotatable horizontally and movable axially, comprising at least one nozzle on one end of the shaft for spraying a powdered resin on a coil located adjacent the noxxle, means for rotating the shaft, and means for moving the shaft axially, whereby the nozzle may be automatically rotated around the coil and moved longitudinally thereof to deposit a predetermined thickness of a coating of powdered resin on selected areas of a coil.

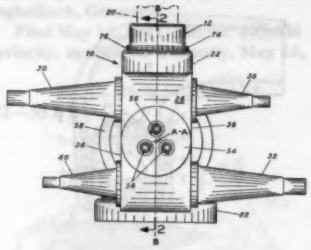
3,747,854

SHIP'S CARGO TANK CLEANER

Carlo E. Anderson, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 77,084, Oct. 1, 1970. This application Dec. 8, 1971, Ser. No. 206,115
Int. Cl. B05b *3/00*
U.S. Cl. 239—227 13 Claims

Apparatus employing rotating nozzles to distribute jets of a cleaning fluid throughout the interior of a ship's cargo tank wherein the speed of rotation of the apparatus is regulated by using opposed jets of controllably different orifice sizes to produce a turning force less than that which would occur if the jets were not opposed to each other and at the same time permitting the use of a jet size which will effectively perform the cleaning operation. The apparatus is designed to be installed permanently within the cargo tanks of oil tankers and provision is made to permit appropriate operating orientation of the apparatus while accommodating supply lines for the cleaning fluid which may be distributed on the top side, the bottom side, or the side walls of the tank.

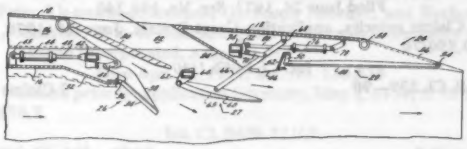


3,747,855

PROPULSION NOZZLES

John William Vdoviak, Marblehead, Mass., and Donald John Dusa, Cincinnati, Ohio, assignors to General Electric Company, Lynn, Mass.

Filed Mar. 1, 1972, Ser. No. 230,840
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.29 7 Claims



A propulsion nozzle is disclosed in combination with a gas turbine engine. The nozzle is of the variable geometry, convergent-divergent type adapted for both subsonic and supersonic operation. The nozzle is also of the two stage ejector type, selectively utilizing tertiary, or ambient, air during subsonic operation. A variable ejector is provided between the convergent and divergent portions of the nozzle. The variable ejector provides a positive expanson surface during supersonic operation and facilitates introduction of secondary and tertiary air during subsonic operation for improved efficiency. The variable ejector may be displaced in a downstream direction and its flaps swung inwardly to block the hot gas stream discharge of the gas turbine engine, for reverse thrut.

3,747,856

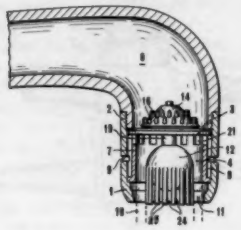
STABILIZER DEVICE FOR A JET OF WATER

Alfons Knapp, Bleichers 3, Biberack/Riss, Germany

Filed Aug. 30, 1971, Ser. No. 176,189
Claims priority, application Italy, Sept. 24, 1970, 70201 A/70
Int. Cl. E03c *1/084;* B05b *1/14*
U.S. Cl. 239—428.5 7 Claims

A device intended for stabilizing an aerated jet of water, comprising a set of several elongated members arranged ac-

cording to the jet direction along at least one of the limit surfaces of the delivered jet, said elongated members being



spaced apart from one another by spaces forming passages for the ambient air.

3,747,857

FUEL INJECTION SYSTEMS

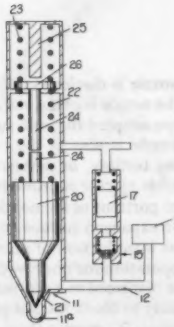
Ivor Fenne, Greenford, England, assignor to C.A.V. Limited, Birmingham, England

Filed June 24, 1971, Ser. No. 156,240

Claims priority, application Great Britain, June 24, 1970, 30,550/70

Int. Cl. B05b *1/30*

U.S. Cl. 239—90 **7 Claims**



A fuel injection system includes a fuel pump and a nozzle incorporating an orifice. There is disposed between the pump and nozzle, a restrictor. The pressure intermediate the restrictor and the pump is controlled by a relief valve and the fuel flowing past the relief valve passes into a chamber. During the initial delivery of fuel by the pump, fuel flows to the nozzle at a restricted rate by way of the restrictor and when a predetermined volume of fuel has past into the chamber substantially un-restricted flow of fuel takes place from the pump to the nozzle.

3,747,858

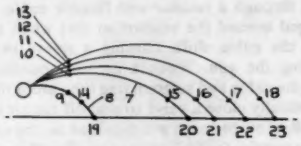
IRRIGATION SYSTEM WITH PULSATING FLOW

Witold Krynicki, 321 Le Roy Ave., Arcadia, Calif.

Filed Dec. 18, 1970, Ser. No. 99,598

Int. Cl. B05b *1/08*

U.S. Cl. 239—99 **1 Claim**



An irrigation system is disclosed wherein a widespread and highly dispersed spray is obtained by periodic variations in output pressure; an integral impeller means is driven by the flow of the input water to control valve means which cyclically varies the pressure in each of a plurality of stationary outlets.

3,747,859

TORCH FOR THERMOCHEMICAL PROCESSING OF WORK PIECES

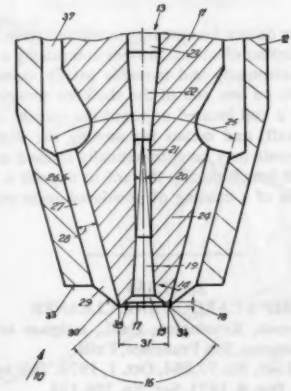
Heinz Gabel, and Gerhardt Lange, both of Frankfurt/Main, Germany, assignors to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Sept. 13, 1971, Ser. No. 179,993

Claims priority, application Germany, Sept. 19, 1970, P 20 46 415.7

Int. Cl. F23d *11/12, 15/00;* B05b *7/06*

U.S. Cl. 239—418 **10 Claims**



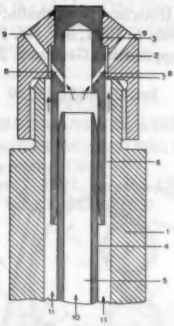
A torch for the thermochemical processing of work pieces has at least one channel for the processing oxygen and at least one channel for the fuel gas and heating oxygen mixture-components in the form of separate channels for the components or a single channel for the mixture. The processing oxygen channel has a depression at its outlet with the depression being at an angle of 90°–150° and preferably 120°.

3,747,860

ATOMIZER FOR LIQUID FUEL

Wilhelmus Habers, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,117
Claims priority, application Netherlands, Oct. 26, 1970, 7015687
Int. Cl. B05b 7/06
U.S. Cl. 239—431 10 Claims



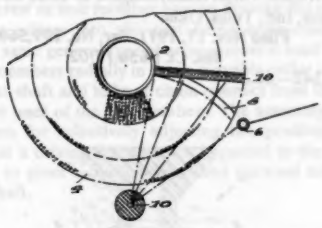
An atomizer for liquids of the type utilizing atomization by a gas is provided with at least two channels which terminate at the head of the atomizer and which communicate with a common supply for the gas. The channels pass through a common, bounded space and at the location of the intersections around their entire circumference communicate with that space. The bounded space communicates with a supply for the liquid.

3,747,861

APPARATUS AND METHOD FOR WINDING FLEXIBLE MATERIAL FOR TWISTLESS PAYOUT THROUGH A STRAIGHT RADIAL OPENING

William A. Wagner, Bronxville, and James W. Newman, Scarsdale, both of N.Y., assignors to Windings, Inc., Yonkers, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,768
Int. Cl. B65h 54/00
U.S. Cl. 242—18 R 5 Claims



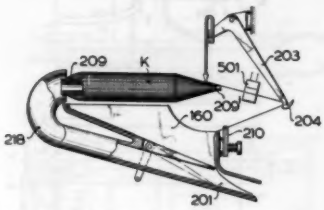
In winding flexible material in a series of figure-8 bights on a spindle or mandrel, with successive cross-overs progressing around the package and with interruption at one point to produce a radial hole through which the interior end of the material is led out, the machine having a guide which moves outwardly as the package builds up, rocking about an axis parallel to the axis of rotation of the spindle, the production of a curved radial opening is prevented by either changing the relative speeds of the spindle and the guide in such a way as to produce the opening at substantially the same angular position in each layer or by shifting the spindle on its shaft slightly as the package builds up for the same purpose.

3,747,862

METHOD AND DEVICE FOR MONITORING THE READYING OF SPINNING COPS FOR UNWINDING THE SAME

Hans Raasch, Rheydt, Germany, assignor to Schlafhorst & Co., Monchengladbach, Germany

Filed May 14, 1971, Ser. No. 143,486
Claims priority, application Germany, May 16, 1970, P 20 24 110.5
Int. Cl. B65h 54/00, 54/22
U.S. Cl. 242—35.6 R 11 Claims



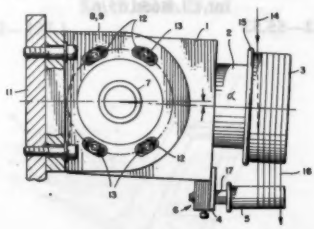
Method of monitoring the readying of hollow core spinning cops for unwinding the same includes seizing an end of a thread located outside a respective spinning cop on which the thread is wound, and feeding the thread end to a measuring device for monitoring a geometric magnitude of the thread before inserting the thread end into the hollow interior of the spinning cop core; and device for carrying out the method.

3,747,863

ADJUSTABLE THREAD DRAWOFF APPARATUS

Peter Klementz, Erlenbach; Christoph Nitschke, and Herbert Haubold, both of Obernburg, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 23, 1971, Ser. No. 136,830
Claims priority, application Germany, May 2, 1970, G 70 16 570.7
Int. Cl. B65h 51/12
U.S. Cl. 242—47.08 7 Claims



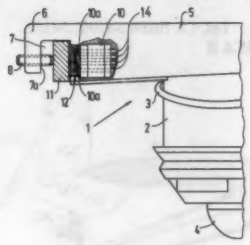
Adjustable thread drawoff apparatus, particularly in combination with stretch twist machines, having a rotatably driven godet and an associated idler roller as drawoff means with a thread or yarn wound several times around the godet and roller pair, together with a common carrier supporting or bearing the godet and roller pair and adjustable supporting means for the pivotal movement of the common carrier on a machine frame. The idler roller is preferably mounted on the common carrier with means to adjust the inclination of its axis of rotation with reference to the godet axis of rotation. The apparatus is especially useful for providing a plurality of combination drawoff means along the face of a stretch twist machine, preferably with simultaneous adjustment of all of the godet and/or idler roller axes.

3,747,864

THREAD DELIVERY DEVICE FOR TEXTILE MACHINES

Karl Isac Joel Rosen, Villa Haga, S-52300, Ulricehamn, Sweden

Filed Nov. 5, 1971, Ser. No. 196,124
Int. Cl. B65h 51/00
U.S. Cl. 242—47.01 6 Claims



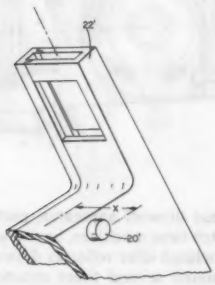
A thread delivery device for a textile machine having a drum onto which a thread which comes from a storage spool can be wound and from where it can be fed to a work place of the textile machine. An electric line system is associated with the device for feeding the wnding drive for the drum or the control elements for the winding drive. A holder supports the drum and has a clamping foot for securing the holder on a support rail. A cable with side-by-side arranged electric supply lines extends along the rail, the cable being connected to a main feed line. A set of contact pins is connected to the line system of the device and is arranged on the clamping foot for electrically connecting the line system of the device to the supply lines during clamping of the holder on the support rail. The supply lines are arranged in a flat cable with a closed insulating sleeve, and the contact pins are sharpened so that they, during clamping of the holder on the support rail, pierce throug the insulating sleeve so as to contact the supply lines.

3,747,865

WEB PROCESSING CARTRIDGES

Frederic Samuel Tobey, Hyde Park, Mass., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Mar. 10, 1971, Ser. No. 122,929
Int. Cl. B65d 85/67
U.S. Cl. 242—55.53 5 Claims



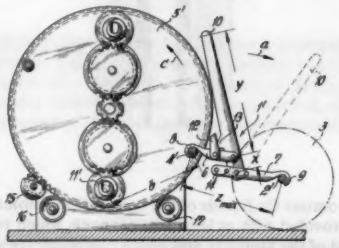
Tape processor and a plurality of tape cartridges; the processor having a cartridge mount including a cartridge locating portion, and a tape drive for advancing tape out of the cartridge along a direction; each cartridge having a supply of tape, a tape guide having a midline and a width about the midline corresponding to the width of the tape, and means for cooperating with the cartridge locating portion when the cartridge is mounted in the processor, thereby to locate the midline of the tape guide in a predetermined position along a line transverse to the tape direction; at least two of the cartridges having tape guides of different widths, the predetermined position being the same for each of the two cartridges.

3,747,866

EQUIPMENT FOR APPLYING A ROLL OF PAPER OR PLASTICS WEB TO A WINDING APPARATUS

Hans-Jurgen Schwermann, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed July 6, 1971, Ser. No. 159,862
Claims priority, application Germany, July 6, 1970, P 20 33 414.9
Int. Cl. B65h 19/30
U.S. Cl. 242—58.6 8 Claims



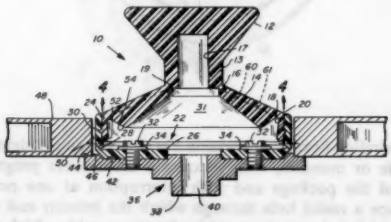
Two separate but like linkages are provided for engaging a respective end of a shaft of a roll of paper or plastics web that is to be applied to mandrels of coiling or uncoiling apparatus. Each linkage comprises a hand lever pivoted by one end to a hooked bar for engaging the end of the roll shaft and pivoted intermediate its ends to another hooked lever for engaging a supporting pin on the coiling or uncoiling apparatus. When the hooks of both linkages have thus been engaged, operation of the hand levers is effective to position the roll in the coiling or uncoiling apparatus so that the roll shaft can be connected to the mandrels.

3,747,867

REEL HUB LATCH

John H. Wilson, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed Nov. 17, 1971, Ser. No. 199,560
Int. Cl. B65h 17/02
U.S. Cl. 242—68.3 10 Claims



This invention describes a simple, inexpensive and effective latch for magnetic tape reels. It involves three parts: the first is a flange or table which can be attached to a motor shaft and on which the tape reel is positioned; the second is a shallow cup coaxially mounted on the table with a short cylindrical wall of diameter slightly less than the inner diameter of the

tape reel which will be placed on the table, the outer wall of said cup outwardly expansible; the third part is an operating member which comprises a central knob which is attached to a conical portion at its small end, the conical portion, at its wide end, connected to a short cylinder which fits inside of the cup wall.

When the knob is pressed inwardly the conical section expands at its wide end, tending to take a planar shape. As it does so, it presses radially outwardly through the cylinder against the cup wall, which is forced outwardly into intimate frictional contact with the inside of the tape reel.

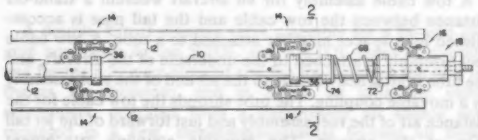
This magnetic tape reel latch is adaptable to pneumatic as well as manual operation.

3,747,868

EXPANSIBLE MANDREL ASSEMBLY

John F. Madachy, Mayfield Heights, Ohio, assignor to Loopco, Industries, Inc., Cleveland, Ohio

Filed Apr. 2, 1971, Ser. No. 130,647
Int. Cl. B65h *75/24*
U.S. Cl. 242—72 10 Claims



The specification and drawings disclose an expansible drum or mandrel assembly particularly suited for use in winding and unwinding sheet material such as paper and the like. The disclosed assembly comprises a rotatably mounted center shaft carrying a plurality of radially movable bar members which define a winding surface. The bar members are connected to the center shaft by a plurality of pivot arms which permit them to be moved radially inward and outward relative to the center shaft to change the effective outer diameter of the assembly. The pivot arms are formed by lengths of roller chain at least threee links in length. One end link of each length of roller chain is joined to respective ones of the sections whereas the other end link of each length is joined fixedly to the center shaft. The links are shown as being connected to the shaft and the arms by small plates which extend over adjacent chain rollers with a screw or bolt member passing through the plate and between the rollers into the part being connected. Additionally, the same general type of arrangement is used for driving the bar members radially in that a movable collar is carried on the center shaft and links of chain connect from the collar to respective ones of the bar members. The assembly also includes means for selectively adjusting the position of the sleeve so that a driving movement is imparted to the arms to cause them to pivot radially inward and outward relative to the center shaft.

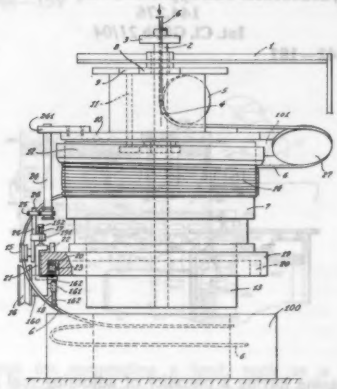
3,747,869

APPARATUS FOR DEPOSITING ELONGATED, FLEXIBLE MATERIAL

Joachim Meyer, Lintorf, Germany, assignor to Frisch Kabel Und Verseilmachinenbau GmbH, Ratingen, Germany

Filed Nov. 22, 1971, Ser. No. 200,934
Claims priority, application Germany, Nov. 27, 1970, P 20 58 378.2
Int. Cl. B65h *47/14*
U.S. Cl. 242—82 5 Claims

An apparatus for depositing elongated, flexible material in a container and including a drum, a revolving coiling head for sequentially winding loops of the material onto the drum, and means for pushing the loops axially down for the respective lowest loop to drop into the container; a pair of pulleys is disposed on a holder revolving about the drum in synchronism with the coiling head; the pulleys grip the material of the dropping loop and at least one of the pulleys runs at a peripheral speed faster than the pay-in speed of the elongated material; the holder runs in an excentrical, closed-loop, revolving track so that the material is deposited in the container in rosetta-shaped pattern.

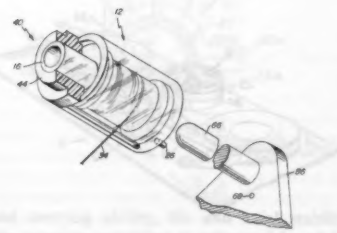


3,747,870

WIRE SPOOL PACKAGE

Scott A. Bonis, Stow; Thomas E. Salzer, Bedford, and David R. Robillard, Westboro, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 859,433, Sept. 19, 1969, Pat. No. 3,635,333. This application Aug. 23, 1971, Ser. No. 174,122
Int. Cl. B65h *49/20*
U.S. Cl. 242—137.1 5 Claims



A protective package for a spool of wire, said package comprising a cup-like container having a longitudinal opening in the periphery thereof and including a center post having an external portion which fixedly supports the container and an internal portion which rotatably supports a spool of wire, and a cylindrical cap which slidingly engages the circular rim of the container thereby retaining the spool wire within said container.

3,747,871

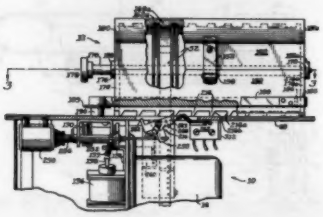
PROJECTOR FOR AUTOMATICALLY THREADING, REWINDING, AND INDEXING A PLURALITY OF FILM SPOOLS AND A MAGAZINE FOR USE THEREWITH

Elmer C. Henriksen, 7045 N. Leotl Ave., Chicago, Ill.

Division of Ser. No. 706,239, Feb. 19, 1968, Pat. No. 3,614,022, which is a continuation of Ser. No. 439,210, March 12, 1965, abandoned. This application May 17, 1971, Ser. No. 144,276

Int. Cl. G03b 21/04

U.S. Cl. 242—181 7 Claims



A magazine having a plurality of adjoining reel compartments supplies film from succesive reels in a film path for forward projection and receives film returned from the path during reverse projection and rewind following forward projection according to the condition of means for moving film between the magazine and a take-up member. During projector threading and rewind, the film path is enlarged and a shuttle for moving film intermittently during projection is prevented from film engagement. Sensing means at the film path condition the projector for (1) forward projection following threading, (2) rewinding following forward projection, and (3) terminating rewinding.

3,747,872

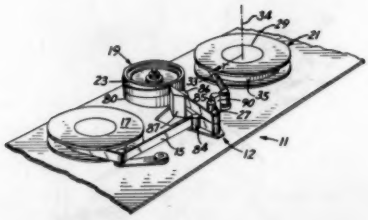
TAPE TRANSPORT WITH CONSTANT TAKE-UP TENSION

Delmar R. Johnson, Barrington, and Raymond J. Precin, Des Plaines, both of Ill., assignors to Ampex Corporation, Redwood City, Calif.

Filed Nov. 26, 1971, Ser. No. 202,522

Int. Cl. B11b 15/32; G03b 1/04

U.S. Cl. 242—206 5 Claims



A tape transport for a magnetic tape recording and/or reproducing apparatus provides a substantially constant tape take-up tension for a magnetic tape traveling at substantially constant velocity to a take-up reel upon which the tape winds. This substantially constant take-up tension is achieved by substantially matching the torque and speed characteristics for the winding motor and for the take-up reel and by providing a transmission between the motor and the reel having a transmission ratio to provide a proportional change between its motor input and reel output to turn the reel at the desired velocites and with the desired torques.

3,747,873

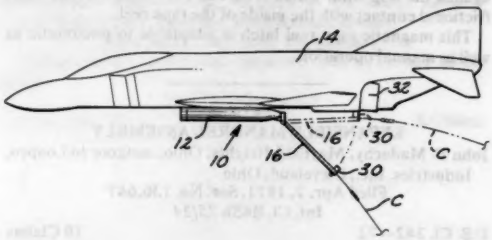
TOW CABLE ASSEMBLY

Gerard E. Layer, Newport Beach; John S. Yates, Placentia, and John A. Kreuzer, Mission Viejo, all of Calif., assignors to The Susquehanna Corporation, Fairfax County, Va.

Filed Nov. 19, 1971, Ser. No. 200,315

Int. Cl. B64d 3/00

U.S. Cl. 244—3 9 Claims



A tow cable assembly for an aircraft wherein a stand-off distance between the tow cable and the tail pipe is accomplished by a spacer member attached to a tube. A tow cable reel assembly is attached to the underside of the aircraft, and the tube is attached directly to the aft end of the reel assembly by a movable coupling. The tube shrouds the tow cable for the distance aft of the reel assembly and just forward of the jet tail pipe of the aircraft. The movable coupling attachment between the tube and the reel assembly allows the tube to rotate in horizontal and vertical planes and to follow the flight path of the tow cable. When the tow aircraft maneuvers in such a manner that the tube and tow cable are moved toward the tail pipe of the aircraft, the spacer member mounted on the tube engages the underside of the aircraft, just forward of the tail pipe, and provides a bridge between the tow cable and the tail pipe. In this manner, the tow cable is prevented from direct contact with the heated tail pipe.

3,747,874

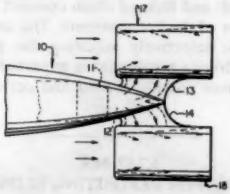
EJECTOR NOZZLE HAVING PRIMARY NOZZLES COMMUNICATING WITH EXHAUST GASES IN PLENUM CHAMBER

Raymond K. Johnsen, La Jolla, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Aug. 25, 1971, Ser. No. 174,670

Int. Cl. F02k 1/02

U.S. Cl. 244—53 11 Claims



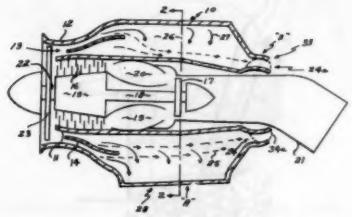
A jet engine aircraft propulsion mechanism has a plurality of primary nozzles mounted to receive engine exhaust gases from a plenum, and to discharge these gases at high velocity rearwardly into and through an ejector nozzle. Ejector pumping action generated by the flow of the exhaust gases rearwardly through the ejector nozzle draws ambient air into and rearwardly through the ejector nozzle along with the exhaust gases, thereby adding the mass of such air to that of the exhaust gases to increase thrust, provide cooling and reduce noise.

3,747,875

V/STOL AIRCRAFT-BY-PASS ENGINE HAVING A DOUBLE, THRUST DIVERTER VALVE ASSEMBLY

Emerson W. Stevens, Snyder, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 4, 1971, Ser. No. 195,601
Int. Cl. B64d *31/00*
U.S. Cl. 244—53 R 1 Claim



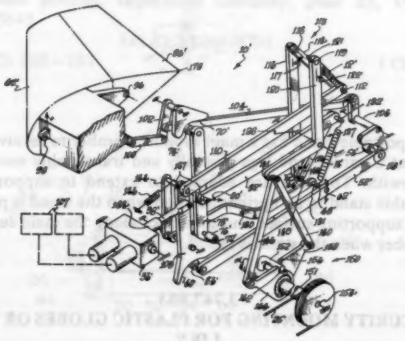
A double, thrust diverter valve assembly for a by-pass engine applicable to the VTOL and V/STOL-types of aircraft and having a by-pass annulus and fan for directing the flow of bypass air thereinto, and in which an inflatable valve mechanism, operated from a compressed air source and mounted in a first, thrust-augmentation by-pass air flow-passage with a rearwardly-directed exhaust, is combined with a cascade valve mounted in a second, by-pass air flow-passage having a vertically-downward directed exhaust and thereby controlling the flow of by-pass air in the vertical flight mode.

3,747,876

VARIABLE LOAD FEEL

Steven L. Fortna, Long Beach, and Ronald W. Koroch, Cerritos, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed June 1, 1971, Ser. No. 148,613
Int. Cl. B64c *13/04*
U.S. Cl. 244—83 D 11 Claims



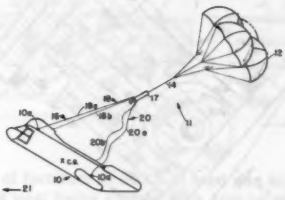
A system to generate control surface feedback forces in an aircraft employing powered control surfaces. The system is primarily mechanical in nature and includes at least two springs as the force generating elements, and means which predeterminately interconnect the springs, predeterminately vary the preload of one spring, and predeterminately vary the effective spring rates of the springs in correspondence to the flight conditions of the aircraft.

3,747,877

LOAD EQUALIZING SLING

Gene R. Drew, El Centro, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1971, Ser. No. 191,277
Int. Cl. B64d *25/06*
U.S. Cl. 244—139 3 Claims



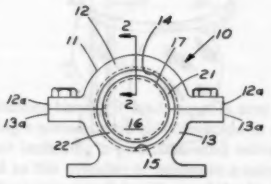
Apparatus for suspending a load, such as a disabled helicopter, having a tendency to swing and gyrate including at least one sling having a pair of leg sections formed of a continuous flexible line, the lower ends of which are secured to opposite sides on the load, the sling being suspended from a load bearing means through which the line freely passes to equalize the load between both leg portions thereof and on the securing points on the load.

3,747,878

TRUNNION MOUNTING

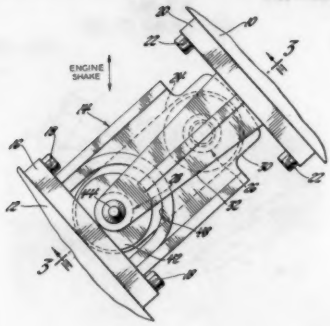
Charles J. Leingang, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 3, 1971, Ser. No. 204,650
Int. Cl. B60k *1/00*
U.S. Cl. 248—9 5 Claims



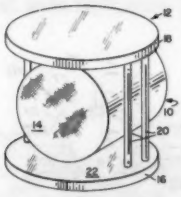
The load carrying ability, life and axial stability of an elastomeric trunnion mounting is enhanced by an improved resilient element. The mounting comprises a housing of segmental parts secured together and trunnion having opposed annular recesses in which is received an annular body of elastomer comprising segmental parts arranged end to end. Segmental relatively non-extensible bands are bonded to opposite sides of the elastomer body and project axially beyond the associated side of the elastomer body. The bands are seated in the opposed recesses. The end surfaces of the elastomer body diverge outward from the adjacent bands at an acute angle to define end surfaces which are convex in radial cross section.

3,747,879
ENGINE MOUNT
William A. Houk, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 23, 1972, Ser. No. 228,560
Int. Cl. F16m *5/00*
U.S. Cl. 248—9 **2 Claims**



An engine mount arrangement having a pair of engine mount assemblies each including a link that resiliently supports an engine at opposite sides on a vehicle frame so that the links do not swing substantially when the engine moves longitudinally or vertically relative to the frame and do swing substantially when the engine moves laterally or rolls relative to the frame. In each engine mount assembly the link is pivotally connected at its opposite ends by a pivot pin which is journaled in a bushing that is both radially and axially supported relative to the link by bodies of resilient material that are continuously loaded in compression.

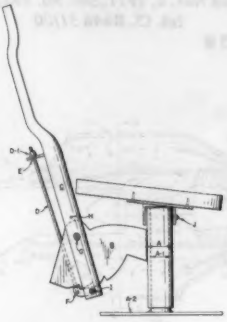
3,747,880
SPEAKER SUPPORT SYSTEM
Richard W. Bock, 2428 McKinley Street, Berkeley, Calif.
Filed July 6, 1970, Ser. No. 52,293
Int. Cl. H04r *1/28*
U.S. Cl. 248—361 R **1 Claim**



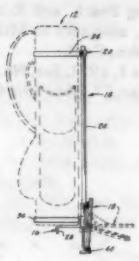
A support system for a speaker cabinet which is connected to a tape deck, phonograph, tuner, amplifier or the like. The speaker cabinet is supported between two vertically spaced support members, and the connection between the cabinet and such members includes a resilient mounting whereby the cabinet vibrations will be dampened.

3,747,881
DEEP SEA FISHING
Walter Akamu, 59 Gartley Pl., Honolulu, Hawaii
Filed Dec. 16, 1969, Ser. No. 870,676
Int. Cl. A01k *97/10*
U.S. Cl. 248—42 **12 Claims**

A deep sea fishing pole holder has a tubular sleeve which slips over a seat pedestal. A vertical plate extends seaward from the sleeve and has ratchet serrations along its lower edge. A pin in the plate above the serrations receives a pole-holding staff. A pin at the bottom of the staff holds a ratchet-engaging pawl. A pawl operating rod extends upward along the tube and terminates in a lock collar and handle, which is held in either a locked or unlocked position. The pawl is held away from the ratchet when the pole is pumped, and the pawl is engaged when it is desired to lock the pole in a selected angular position.



3,747,882
PORTABLE STAND STRUCTURE
Daniel Leis, Box 237, Garden Plain, Kans.
Filed June 21, 1971, Ser. No. 155,143
Int. Cl. A63b *55/10*
U.S. Cl. 248—96 **4 Claims**

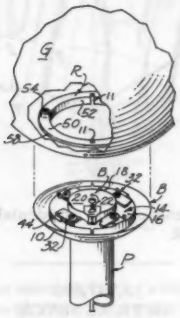


A portable stand has a main support member to receive and mount a parcel, and legs pivotally and translatably mounted therewith. The legs are adapted to extend to support the portable stand in an upright position when the stand is placed on a supporting surface and to retract along the main support member when the stand is raised.

3,747,883
SECURITY MOUNTING FOR PLASTIC GLOBES OR THE LIKE
Richard B. Inman, De Kalb, Ga., assignor to Trimble House Corporation, Atlanta, Ga.
Filed Feb. 26, 1971, Ser. No. 119,184
Int. Cl. F16m *11/04*
U.S. Cl. 248—187 **4 Claims**

A security mounting to hold a plastic light globe such as that found on street lights, park lights and the like, to the pole to discourage removal of the globe by vandals or thieves. A hemispherical metal bracket has a collar portion which fits

over the pole and an internal screw which is securely tightened in place before the globe is assembled. A metal clamp ring is fitted inside the globe around the circular opening therein and the globe is fitted to the dish-shaped metal saucer forming part of the bracket to support the bottom of the globe outside and then through small openings a special tool is inserted to rotate individually small tongues held in place by locking screws which are individually tightened on top of the ring forcing the ring against the periphery of the globe and against the bottom,



outside dish-like support. The tool entrance is just large enough for the special wrench and does not permit the use of ordinary pliers, adjustable wrenches or other common tools to release the screws and rotate the small tongues. The set screw for holding the bracket on the pole cannot be reached without removing the globe and so without the special tool it will be necessary for a thief or vandal to spend a good bit of time and cause considerable destruction to the globe and the bracket before it could be removed.

3,747,884

STAND FOR PHOTOGRAPHIC APPARATUS

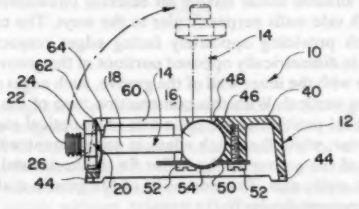
Kurt Steisslinger; Willi Weidenbach, and Ernst Lutz, all of Stuttgart, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 18, 1971, Ser. No. 154,576

Claims priority, application Germany, June 25, 1970, 70238641

Int. Cl. F16m *13/04*

U.S. Cl. 248—181 1 Claim



A stand for supporting a photographic camera includes a base and a connecting arm. The arm is movably supported within a bearing in the base by a spring washer. In one embodiment, the arm may be folded into a recess in the base for storage. In a second embodiment, the bearing and arm are vertically movable within the base for storage.

3,747,885

MODULAR JOINT

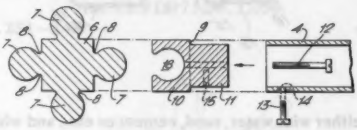
George Ernest Stora Ciancimino, London, England assignor to Ciancimino Design Limited, London, England

Filed Apr. 16, 1971, Ser. No. 134,657

Claims priority, application Great Britain, Apr. 21, 1970, 19,121/70

Int. Cl. F16b *3/00*

U.S. Cl. 248—188.1 5 Claims



An article of furniture in which at least one support post is provided, the post being formed with two or more longitudinally extending slides. One end of a transition piece is slidably engaged with each slide and can be secured against sliding movement by a locking screw. The other end of the transition piece is secured to a horizontal support member by a further locking screw. In a preferred arrangement, four equiangularly spaced slides are provided which enables a furniture system to be built up based on a rectangular modulus.

3,747,886

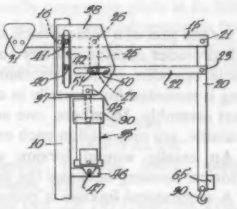
LOAD BALANCER WITH SAFETY CONTROL

Arthur B. Carlson, and Robert W. Watson, both of Mendota, Ill., assignors to Conco Inc., Mendota, Ill.

Filed Sept. 20, 1971, Ser. No. 181,906

Int. Cl. B66d *1/00*

U.S. Cl. 248—325 5 Claims



A load balancer having a load support arm with a power cylinder having a piston operably connected to the arm with a control circuit including a pilot operated valve for directing pressure fluid to the cylinder to maintain a constant pressure on the cylinder piston in all positions of the load support arm with means for limiting the rate of movement of said load support arm in the event that either the load is lost or there is a loss of fluid pressure acting on said piston when there is a load on the load support arm.

3,747,887

WIND WEIGHT

Jonathan A. Binkley, 1786 Bucklew Dr., Toledo, Ohio

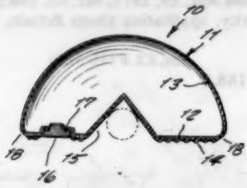
Filed Dec. 13, 1971, Ser. No. 207,103

Int. Cl. A47c *7/00*

U.S. Cl. 248—361 R 1 Claim

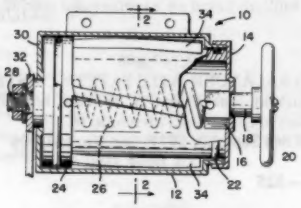
A set of hold downs for securing lightweight tubular aluminum furniture out-of-doors, such as on a patio, so to prevent gusts of high wind from knocking it over or blowing it away, the hold down consisting of a pair of wind weight

placeable across a front and rear bar of a chair, lounge or the like, each wind weight comprising a hollow container that can



be filled either with water, sand, cement or etc., and which can be in any decorative design for a pleasing appearance.

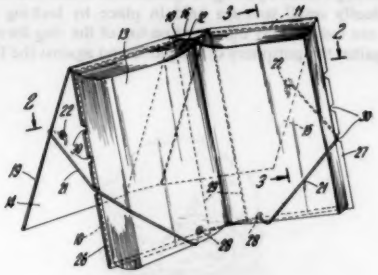
3,747,888
RESILIENTLY MOUNTED VEHICLE SEAT
Frank A. Heckett, 9809 34th Ave. S.W., Seattle, Wash.
Filed Feb. 15, 1972, Ser. No. 226,583
Int. Cl. F16f 5/00, 13/00; B62j 1/04
U.S. Cl. 248—373 **4 Claims**



A ride control for the seat of a vehicle such as a motorcycle is disclosed which provides cushioned body support and soft ride for the vehicle operator without excessive rebound. A cylindrical housing is mounted horizontally in a fixed position relative to the seat assembly. Members, one adjustably fixed and the other rotatable, are mounted in each end of the cylindrical housing. An axially wound torsion spring extends through the cylindrical housing between the members and is secured thereto. A mechanical linkage is connected between the rotatable member and frame of the vehicle for movement in response to dynamic and/or shock loadings imposed on the vehicle and seat. A plurality of blades extend axially from the rotatable member. The cylindrical housing is partially filled with a viscous fluid through which the blades must pass. A drag is imposed on the movement of the rotatable member by passage of the blades through the viscous fluid during loading and unloading of the torsion spring, thereby dampening and cushioning shock and dynamic loadings imposed on the seat.

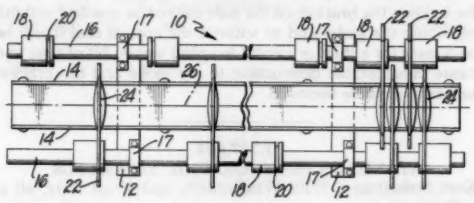
3,747,889
COMBINATION BOOK PROTECTOR AND READING PROP
Elizabeth B. Gerald, 203 E. 60th St., New York, N.Y.
Filed May 17, 1971, Ser. No. 144,040
Int. Cl. A47b 97/08
U.S. Cl. 248—451 **7 Claims**

A pair of book-cover-size panels are joined by a flexible web, so that when book is closed one panel overlies each book cover and web overlies book spine. Flaps hinged to upper edges of panels are located against inner surfaces of book cover to connect panels to covers. Panels may be swung rearwardly to serve as book prop. A single flexible band, which may be stretchable, is secured at its ends to the panels, extends around the pages of an opened book, and extends between the flaps at their lower edges, to limit rearward swing of panels,



hold pages down, and prevent accidental separation of the device from the book.

3,747,890
OPTICAL BENCH
Eldred F. Tubbs, Claremont, Calif., assignor to Harvey Mudd College, Claremont, Calif.
Filed Apr. 24, 1972, Ser. No. 246,766
Int. Cl. G02b 27/32
U.S. Cl. 248—466 **9 Claims**



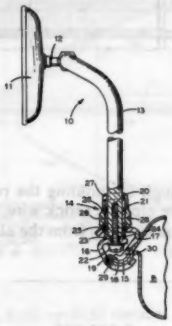
An optical bench comprising parallel, horizontal primary and secondary ways and a plate-like carrier seated on and slidable longitudinally along two of the ways. A secondary way is circular in cross section and is provided thereon with a longitudinally slidable collar having an external circumferential groove with side walls perpendicular to the ways. The carrier has a notch providing oppositely facing edges respectively receivable in diametrically opposed portions of the groove and engageable with the inner wall of the groove, such edges of the notch being vertical. With this construction, two of the ways fix the vertical position of the optic axis of an optical element on the carrier, while the notch edges in engagement with the inner wall of the groove in the collar fix the horizontal positions of the optic axis. The side walls of the groove maintain the carrier penpendicular to the ways.

In practice, there are two of the circular ways in laterally spaced, parallel relation and each is equipped with at least one of the collars mentioned. One carrier on the optical bench will have its notch in engagement with a collar on one of the circular ways, while the next carrier on the bench will have its notch in engagement with a collar on the other circular way, the configuration of the carriers being such that each carrier clears the collar on the opposite circular way. With this construction, optical elements on the two carriers can be placed in very close proximity to each other.

3,747,891
CLAMP-ON MIRROR ASSEMBLY

Sol Englander, 147-07 77th Pl., Flushing, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,340
Int. Cl. B60r 1/06
U.S. Cl. 248—475 R 3 Claims

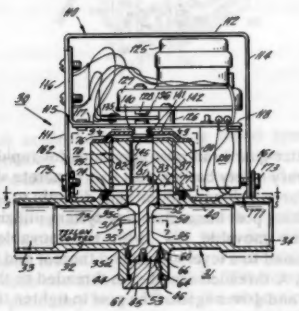


A clamp-on mirror assembly having a mirror connected to a support rod which in turn is secured to the drain channel of an automobile by an adjustable clamp at the end of the rod.

3,747,892
MAGNETIC VALVE

Otto M. Gigantino, Newark; Victor Parrill, Hawthorne, and Leonard D. Gigantino, Maplewood, all of N.J., assignors to Wm. Steinen Mfg. Co., Parsippany, N.J.

Filed Jan. 27, 1972, Ser. No. 221,288
Int. Cl. F16k 31/08
U.S. Cl. 251—65 6 Claims

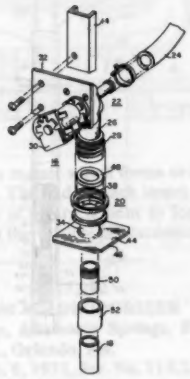


A magnetically driven valve structure having a driving sleeve magnet operated by a motor and a driven magnet coaxial with the driving magnet connected to a valve. The housing for the motor and the driving magnet is separable from the valve structure to permit soldering the valve structure into a fluid circuit without deleterious effect on the motor, motor controls and driving magnet. The basic valve structure is a forging having a platform supporting the housing. The housing is centered on the forging equidistant from the ends thereof. The driven magnet is housed in a hat-like non-magnetic cylindrical enclosure on the forging, the flanges of the hat being sealed to the forging by a rolled over lange of the forging and an O-ring gasket. The driving magnet is compliantly connected to the motor to permit the driving magnet to align itself properly on the outside of the hat-like enclosure and with the driven magnet. The valve is a Teflon coated gate valve which is longitudinally compliantly mounted with respect to the driven magnet to permit the valve to seat properly without restraint. The valve is gasketed in its seat by an O-ring held by the valve which may ride vertically, with the valve, in an annular bore in the valve seat.

3,747,893
FLUID COUPLING WITH SINK RETAINER

Olan L. Long, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Int. Cl. F16l 15/00, 35/00
U.S. Cl. 251—148 4 Claims

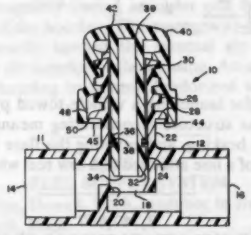


A metal fitting particularly adaptable for use with a dishwasher water supply valve of the character having a plastic body is disclosed, in which the fitting includes a coupling ring which may be turned onto the inlet end of the supply valve, and includes a tubular body carrying the coupling ring and having an outwardly projecting plate at its inlet end serving as both a heat sink for heat applied upstream from the fitting on the metal water supply conduit, and retaining the coupling ring from disengagement off the inlet end of the fitting.

3,747,894
STOP VALVE

Kenneth V. Pepper, Davison, Mich., assignor to Genova Products, Davison, Mich.

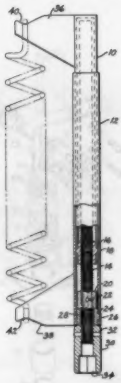
Filed Dec. 22, 1971, Ser. No. 210,677
Int. Cl. F16k 31/50
U.S. Cl. 251—215 4 Claims



A thermoplastic stop valve that includes a valve body and an integral valve element and handle. The integral valve element and handle are movable between open and closed positions, and interlocking means are provided so that when the valve element and handle are initially assembled with the

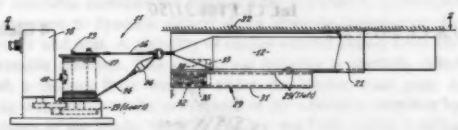
valve body the assembled parts are interlocked together to prevent inadvertent removal thereafter of the valve element and handle when moved to an open position.

3,747,895
SPRING EXTENDER
Marcus Martin, 1570 E. Hurd St., Monroe, Mich.
Filed Nov. 4, 1971, Ser. No. 195,555
Int. Cl. B25b *27/00*
U.S. Cl. 254—10.5 **5 Claims**



An inexpensive spring extender comprising: a pair of arms one of which has thread engagement with a lead screw and the other of which is swivelled to the lead screw between opposing abutments. The arms are adapted to engage opposite ends of a coil spring, and the lead screw when actuated extends the spring.

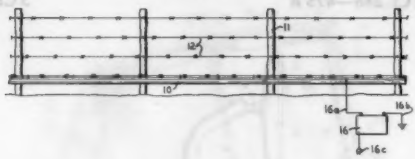
3,747,896
ELECTROMECHANICAL FLARE LAUNCH AND JETTISON DEVICE
Richard A. Botzum, Chania Island Crete, Greece, assignor to Northrop Corporation, Los Angeles, Calif.
Filed June 21, 1971, Ser. No. 155,168
Int. Cl. B66d *1/30*
U.S. Cl. 254—150 **5 Claims**



Apparatus for launching a vehicle-towed pyrotechnic type flare or similar structure incorporating means for launching, automatically braking, and enabling the flare to be jettisoned from the end of a line attached to a tow reel when desired.

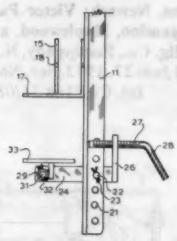
3,747,897
METHOD AND APPARATUS FOR PROTECTING LIVESTOCK
Charles F. Conley, Otter, Mont.
Filed Oct. 16, 1972, Ser. No. 297,790
Int. Cl. A01k *3/00*; H05c *1/00*
U.S. Cl. 256—10 **6 Claims**

A livestock protection method of providing an enclosure fence with an electric shock wire and an odoriferous, noxious repellent whereby a predator simultaneously receives an electric shock while sensing the repellent. Flexible stripping material for attachment to the enclosure fence is disclosed



which provides a trough for holding the repellent, an insulation lip for holding the electric shock wire, and a deflector for holding weeds and grasses away from the electric wire.

3,747,898
GUARD RAIL POST
Wayne E. Warren, 3801 41st St., Tampa, Fla.
Filed Apr. 19, 1972, Ser. No. 245,447
Int. Cl. E04h *17/20*
U.S. Cl. 256—59 **4 Claims**

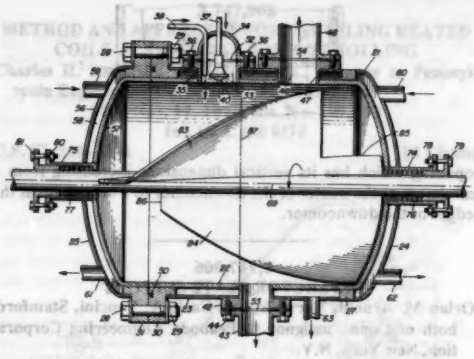


A perimeter guard rail post apparatus for rapid installation of a temporary safety barrier post to a concrete slab and having means for attaching wooden rails directly to the post. The quick attaching post has a clamping system utilizing one fixed jaw and one movable jaw, with the movable jaw being movably pinned to a lever at one end thereof and fulcrummed on the post. A threaded member is threaded to the other end of the lever and drives against the post to tighten the clamp.

3,747,899
MIXER
George A. Latinen, deceased, late of Springfield, Mass. (by May V. Latinen, administratrix), and Leo F. Carter, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.
Filed Aug. 16, 1971, Ser. No. 172,107
Int. Cl. B01f *7/04*
U.S. Cl. 259—9 **11 Claims**

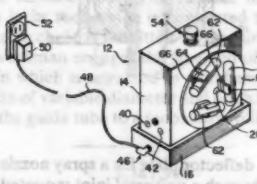
A housing and paddle assembly adapted for use in processing and mixing highly viscous fluids is provided. The mixer employs a paddle assembly which rotates about a horizontal axis and which has at least one pair of diametrically opposed blade members which helically extend along the shaft in an axial direction and which are slotted at diagonally op-

posite outside ends. In operation, the paddle assembly can sweep out substantially all of the housing interior and produce



simultaneously in a fluid cyclical vertical displacement, rolling action, horizontal displacement, and, even, fold over action.

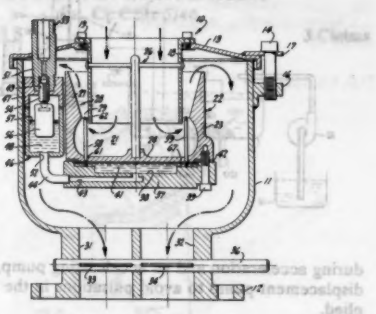
3,747,900
BLOOD SPECIMEN OSCILLATOR
Robert L. Dilts, 2521 E. 38th St., Indianapolis, Ind.
Filed July 20, 1970, Ser. No. 56,278
Int. Cl. B01f *9/00*
U.S. Cl. 259—57 **7 Claims**



Means for controllably oscillating blood specimen containers comprising support means, motor means mounted on the support means, a plate drivingly connected to the motor means and mounted for rotation relative to the support means, and means for removably fastening such containers to the plate for movement therewith. The fastening means may include magnetic means or cooperating Velcro strips or pieces for holding such containers to the plate. If the magnetic means is used, the plate may be metal and the magnetic means may include a clip portion for engaging such containers and a magnet portion connected to the clip portion. The support means includes a light-weight housing which can be carried in one hand and which includes a battery-operated motor for rotating the plate.

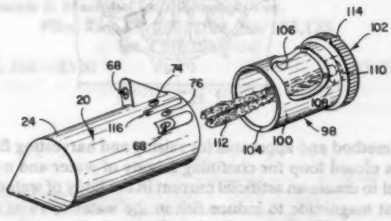
3,747,901
CARBURETOR APPARATUS
George C. Coverston, 76 S. Russell St., Fallon, Nev.
Filed Apr. 21, 1972, Ser. No. 246,258
Int. Cl. F02m *19/04*
U.S. Cl. 261—1 **2 Claims**

Carburetor apparatus for vaporizing and mixing a liquid fuel with a stream of gas. An incoming stream of gas is directed through an annular venturi. The outlet ends of a plurality of circumferential spaced-apart fuel jet tubes project into the throat portion of the venturi. The fuel jet tubes have their inlet ends in communication with a supply of fuel confined within a reservoir. Elongate inserts mounted within the tubes are radially spaced from the tube inner surfaces to define relatively small cross sectional area capillary fuel flow passageways. The inserts are adapted for both vertical and lateral displacement



to dislodge any foreign matter which forms or deposits within the tube passageways. The end of each insert which projects into the fuel reservoir is reversely bent to form an enlarged portion serving to limit the vertical displacement of the insert.

3,747,902
ROOM AIR DEODORIZER
James Rushton Bailey, Altamonte Springs, Fla., assignor to Rush-Hampton, Inc., Orlando, Fla.
Filed Feb. 8, 1971, Ser. No. 113,236
Int. Cl. B01d *47/00*
U.S. Cl. 261—30 **20 Claims**

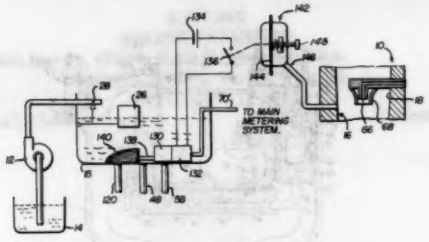


A device for contacting odoriferous air with a deodorizing material includes a substantially hollow housing having an external air deflector at one end and an internal air deflector at the other end. At least two air carrying conduits extend outwardly from the outer surface of the housing. Each conduit has an air passageway having an outer end spaced from the outer surface of the housing. The passageway extends from its outer end inwardly toward the internal air deflector in a straight line to the interior of the housing. An air outlet is provided on the housing to permit deodorized air to leave the housing.

3,747,903
FUEL SUPPLY SYSTEM
Harold E. Phelps, Howell, Mich., assignor to Harold E. Phelps, Inc., Plymouth, Mich.
Division of Ser. No. 843,384, July 22, 1969, Pat. No. 3,645,256. This application Aug. 2, 1971, Ser. No. 167,911
Int. Cl. F02m *69/02*
U.S. Cl. 261—27 **6 Claims**

A fuel supply system incorporating a downdraft carburetor having an idle metering system and also an enrichment valve that causes both the engine speed to increase and an enriched

air-fuel mixture to be supplied to the engine for cold engine operation. The carburetor has a main metering system that has its main metering valve element mechanically linked to the throttle valve, a restrictor valve that prevents overcharging



during acceleration and an accelerating pump, and a positive displacement pump to avoid pulsations in the fuel being supplied.

3,747,904

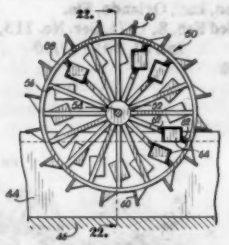
APPARATUS FOR AERATING WATER

William R. Gross, P. O. Box 510, El Dorado, Kans.

Division of Ser. No. 34,244, May 4, 1970. This application July 2, 1971, Ser. No. 159,351

Int. Cl. A01k *63/00*

U.S. Cl. 261—92 4 Claims



A method and apparatus for raising and harvesting fish utilizes a closed loop for confining a body of water and a paddle wheel to create an artificial current in the body of water of sufficient magnitude to induce fish in the water to swim against the current. Feeding mechanism disposed adjacent the paddle wheel is operable to introduce feed into the water. The artificial current created by the paddle wheel induces fish in the water to swim against the current and toward the food supply. A plurality of air-gathering buckets on the paddle wheel aerate the water to assure an adequate supply of oxygen for the fish. A portion of the closed loop defines an open ended container which is periodically operated to confine a number of fish when the latter have gathered to partake of the food. The container has a curved surface defining its bottom and rotatable structure is disposed longitudinally of the container for rotation over the curved surface to remove any fish confined within the container.

3,747,905

CONTACT APPARATUS AND METHOD

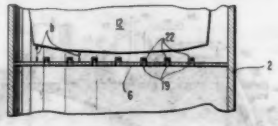
Dale E. Nutter, Tulsa, Okla., assignor to Irving E. Nutter; Martha C. Nutter, and Nancy N. Pantaleoni, all of Tulsa, Okla.; a part interest to each

Filed Nov. 10, 1970, Ser. No. 88,395

Int. Cl. B01d *3/16*

U.S. Cl. 261—114 R 15 Claims

Improved liquid flow patterns across a cross-flow bubble tray of circular plan form are achieved by introducing the ascending gases to the liquid in a direction which is exclusively lateral to the liquid flow direction, and introducing liquid at the upstream end of the tray through a downcomer escape



opening which has its vertical dimensions increasing from a minimum at the center of the downcomer to a maximum at the edges of the downcomer.

3,747,906

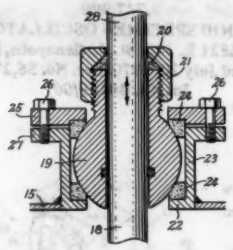
DEFLECTOR PLATE SUPPORT

Orlan M. Arnold, Norwalk, and Carlo A. Vancini, Stamford, both of Conn., assignor to Peabody Engineering Corporation, New York, N.Y.

Filed June 9, 1972, Ser. No. 261,259

Int. Cl. B01d *47/02*

U.S. Cl. 261—118 5 Claims



A support for a deflector plate for a spray nozzle comprising a rod extending through a universal joint mounted for angular adjustment and slidable in the universal joint for axial adjustment. The universal joint may be located in the wall of an air duct carrying the air to be sprayed.

3,747,907

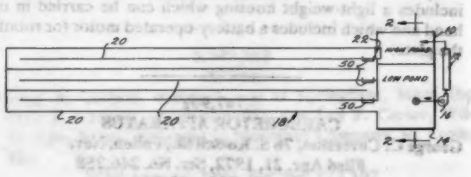
NIGHT STREAM COOLING SYSTEM AND METHOD

James H. Anderson, 1615 Hillock Ln., York, Pa.

Continuation of Ser. No. 18,269, March 10, 1972, abandoned. This application June 28, 1972, Ser. No. 267,198

Int. Cl. B01f *3/04*

U.S. Cl. 261—128 10 Claims



A cooling water storage system includes two water storage ponds, one pond being located at a higher elevation than the other. The water temperature in the lower pond is reduced by flowing the water from the high pond to the low pond during the nighttime in a manner such that a large water surface area is exposed to the atmosphere under conditions which are con-

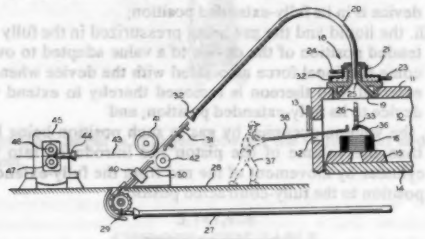
ducive to cooling of the water by radiation, conduction, convection and evaporation.

3,747,908

METHOD AND APPARATUS FOR UNCOILING HEATED COILS OF STEEL BAR FOR HOT ROLLING

Charles H. Anderson, McMurray, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Nov. 17, 1971, Ser. No. 199,613
Int. Cl. C21d 9/54
U.S. Cl. 266—1 R **10 Claims**



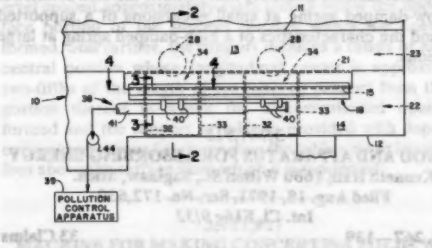
A billet is hot rolled to convert it to an elongated bar of intermediate cross sectional size. The bar is wound previously into a coil and placed in a furnace to reheat it for subsequent rolling and size reduction. The coil stands on its axis in the furnace with a free upper end thereof accessible to a workman through the furnace door. The furnace has a conical exit passageway in its roof which is connected to a curved guide tube. A starter chain is admitted to the furnace through the tube. The workman engages the free end of the coil with the starter chain which is retracted to withdraw the bar from the coil as a helix of variable diameter and pitch. The uncoiled bar is fed from the guide tube to a secondary rolling mill.

3,747,909

CHARGING AISLE EXHAUST SYSTEM

John H. Richards, Beaver, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 27, 1971, Ser. No. 212,498
Int. Cl. C21c 5/38
U.S. Cl. 266—13 **7 Claims**



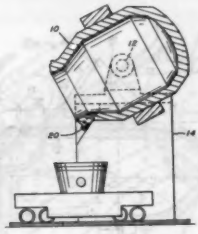
An exhaust system for preventing release to the atmosphere, of the large volume of pollutants produced in the charging aisle during the introduction of a "hot charge" and a "cold charge" into a high-temperature furnace, such as a basic oxygen furnace. The exhaust system provides a shaft directly above the charging aisle and adjacent to the furnace. The shaft directs the pollutants from the charging aisle to suitable exhaust means which, in turn, directs the pollutants to pollution control apparatus.

3,747,910

SCREED FOR CLEARING NOSE OF TILTING VESSEL

Peter P. Pincura, Jr., Amherst, and Luis T. Sanchez, Lorain, both of Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1971, Ser. No. 168,936
Int. Cl. C21c 5/46
U.S. Cl. 266—1 S **3 Claims**



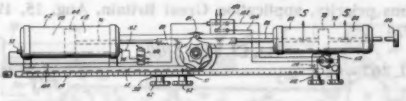
An elongated screed bar, the end of which is secured to the concrete support columns for a basic oxygen furnace vessel, and positioned to scrape the skull from the vessel mouth as the vessel is tilted to dump the slag therefrom.

3,747,911

CIRCLE METAL CUTTER

Claud T. Skipper, Houston, Tex., assignor to Productive Instruments & Machine, Inc., Houston, Tex.

Filed Aug. 19, 1971, Ser. No. 173,135
Int. Cl. B23k 7/04
U.S. Cl. 266—23 M **23 Claims**



The circle metal cutter comprises a radial arm mounted on a centering block which has been centered on the circle to be cut in the metal work piece, an acetylene torch mounted on the end of the radial arm, and a motor mounted on the radial arm to pivot the radial arm on the centering block and about the center of the circle to be cut. The motor includes an actuating cylinder and a dampening cylinder each having a piston with a piston rod attached to a rack which engages a stationary pinion mounted on the centering block whereby upon the reciprocation of the rack the radial arm will rotate about the centering block thereby permitting the torch to cut a circle in the metal work piece. The actuating cylinder powers the rotation of the radial arm by a hydraulic force against the piston. The dampening cylinder regulates the velocity of the radial arm by incorporating a needle valve in the piston which regulates the flow of a fluid in the dampening cylinder thereby creating resistance to the movement of the piston in the actuating cylinder. The source of fluid for the actuating cylinder and the torch comes from a common source.

3,747,912

CONVERTER FOR TREATMENT OF MOLTEN DUCTILE CAST IRON WITH VAPORIZABLE ADDITIVES

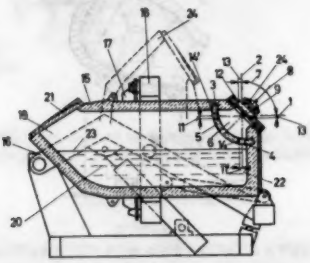
Max Wernli, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Apr. 19, 1972, Ser. No. 245,457

Claims priority, application Switzerland, Apr. 23, 1971, 5924/71

Int. Cl. C21c 5/46, 7/00

U.S. Cl. 266—34 T 6 Claims



A vessel, which can be tipped, is formed with an internal separate chamber which has openings therein, so located that the direction of the openings converge. The vessel has a closable charging opening, for the addition of a vaporizable additive into the chamber, the converging openings having central axes which are directed towards the closable opening. Preferably, the central axis of the charge opening to the chamber bisects the central axes of the communication openings so that, when a vaporizable substance is introduced through the charge opening into the chamber, molten iron within the vessel will penetrate within the chamber to contact the additives in the chamber upon tipping of the vessel.

3,747,913

FLUID SPRING SHOCK ABSORBERS

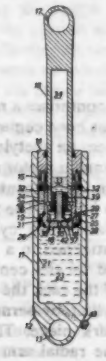
Ralph Savery, Gloucester, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed Aug. 2, 1971, Ser. No. 168,211

Claims priority, application Great Britain, Aug. 15, 1970, 39440/70

Int. Cl. F16f 5/00

U.S. Cl. 267—64 R 12 Claims



A shock absorbing and energy dissipating device suitable for an aircraft landing gear comprising:

i. a cylinder;

ii. a piston rod, of smaller diameter than the internal diameter of the cylinder, movable into and out from the cylinder through a seal at one end of the cylinder, the other end of the cylinder, which is the end intended to be lowermost in use, being closed;

iii. a piston carried by the piston rod and sealingly engaging the cylinder;

iv. a volume of liquid in the cylinder;

v. means for restricting flow of liquid from one side of the piston to the other as the piston moves in the cylinder towards said other end of the cylinder;

vi. a container, containing a volume of gas in direct unrestricted communication with liquid at the said one end of the cylinder; and

vii. flow-passage means adapted to permit unrestricted flow of fluid from one side of the piston to the other when the device is in its fully-extended position;

viii. the liquid and the gas being pressurized in the fully extended position of the device to a value adapted to overcome frictional force associated with the device when an external load thereon is removed thereby to extend the device to its fully-extended position; and

ix. the volume occupied by gas in such position being less than the volume of the piston rod introduced into the cylinder by movement of the rod from the fully-extended position to the fully-contracted position.

3,747,914

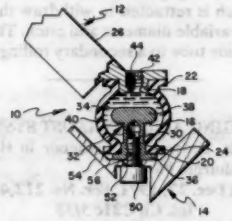
VIBRATOR ISOLATOR ASSEMBLY

Howard G. Thrasher, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 17, 1971, Ser. No. 181,343

Int. Cl. F16g 11/00

U.S. Cl. 267—136 10 Claims



A vibrator isolator assembly that exhibits the characteristics of a low-damped spring at small excursions of a supported mass and the characteristics of a high-damped spring at large excursions.

3,747,915

METHOD AND APPARATUS FOR ABSORBING ENERGY

Frank Kenneth Hall, 1600 Wilson St., Saginaw, Mich.

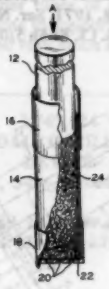
Filed Aug. 18, 1971, Ser. No. 172,639

Int. Cl. F16g 9/32

U.S. Cl. 267—139 33 Claims

A method of absorbing energy wherein a plurality of elastomeric particles absorb energy by virtue of shear forces and friction created by interaction between a thrust member and a container for the particles which container is adapted to receive the thrust member and allow passage of the member therethrough. The particles may pass through openings in the thrust member as well as between the thrust member and the container for the particles and may be retained in the container or discharged from the container. In one application of the invention, the particle container is mounted on a vehicle

and the thrust member is attached to a bumper by suitable linkage to absorb the energy of an impact force on the bumper



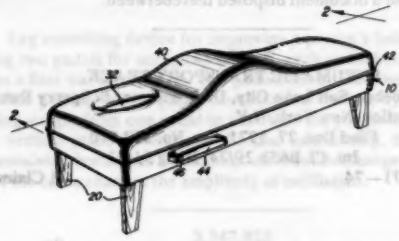
when the bumper is engaged between the vehicle and another object.

3,747,916

CHIROPRACTIC TABLE

John S. Benson, 335 W. Main St., P. O. Box 81, Hamilton, Mont.

Filed July 19, 1971, Ser. No. 163,772
Int. Cl. A61g *13/00*
U.S. Cl. 269—322 **2 Claims**



An elongated bench-type support upon which a patient to receive spinal or other body adjustments may be disposed in a horizontal face downward position. One end of the support includes a centrally disposed elongated opening extending longitudinally of the support and spaced slightly from the terminal end thereof. Further, the end of the table in which the opening is formed has opposite side horizontally disposed and longitudinally extending armrests supported therefrom at a level spaced approximately eight inches below the upper surface portion of the support through which the opening is formed. Still further, the support includes a raised or humped central portion whose longitudinal center is approximately two-fifths of the length of the table or support from the end portion thereof in which the aforementioned opening is formed and the support or table is provided with depending corner leg portions for supporting the table approximately one foot above the surface from which it is supported.

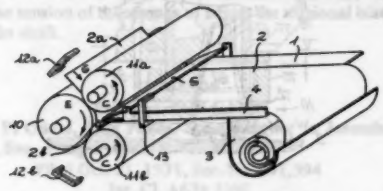
3,747,917

MACHINE FOR MAKING CONCERTINA FOLDS WITH REVERSIBLE ROLLERS AND MEANS FOR REVERSING SAME

Donato Roda, Bologna, Italy, assignor to Faltex-Falzmaschinenfabrick AG, Wohlen, Switzerland

Filed July 12, 1971, Ser. No. 161,737
Int. Cl. B65h *45/14*
U.S. Cl. 270—68 R **4 Claims**

A machine for folding strips of sheet material for example paper or cardboard or the like in a concertina-like manner. It comprises a plane member for the sliding of the strip of sheet material which is to be folded and a device suitable to prevent the returning of the strip. The device is arranged at the end of the plane member towards which the strip slides. It further comprises a pair of folding members consisting of a first roller means and a pair of second rollers parallel to and tangentially engaged with the first roller means. The second rollers are rotatably supported at the outlet of said non-returning device



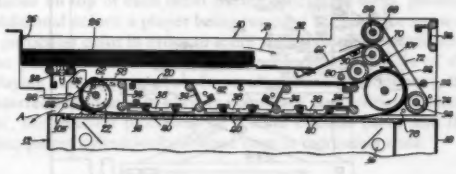
so as to lie above and below the strip respectively and cooperate with said first roller means so as to grip the strip alternately and form the folds. Inversion means are provided to drive the rollers alternately in opposite directions and photoelectric members are positioned to actuate the inversion means according to the position of the folded sheet material. Another photoelectric device detects the trailing end of the sheet and causes ejection of the folded sheet.

3,747,918

DOCUMENT FEEDER CONTROL CIRCUIT

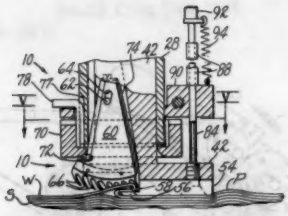
Harry Margulis, Hofmann Estates, and Roy D. Korff, Elk Grove Village, both of Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Nov. 22, 1971, Ser. No. 201,071
Int. Cl. B65h *5/02, 7/20*
U.S. Cl. 271—4 **3 Claims**



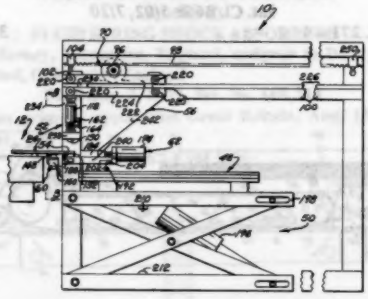
A document feeder transfers original documents placed in a stack one at a time in succession into a copying position on an exposure platen of a copy machine. The control circuit for the feeder includes means for initiating the feeding of an original document from a stack of original documents in the tray of the document feeder into and along a transport path. The control circuit additionally enables the document feeder to expel an original document from the exposure platen of a copy machine after a desired number of copies have been made. The control circuit further includes means to prevent the feeding of further original documents into and along the transport path until the desired number of copies of a previously fed original document are completed. The control circuit further controls the initiation of the copying process of the copy machine. Additionally, means are provided to detect the jamming of an original document during its expulsion from the exposure platen of the copy machine.

3,747,919
ADJUSTABLE WORK PICK-UP DEVICE
James B. Stewart, and Carlton G. Lutts, both of Salem, Mass., assignors to USM Corporation, Flemington, N.J.
Filed June 6, 1972, Ser. No. 260,304
Int. Cl. B65h 3/22
U.S. Cl. 271—19 2 Claims



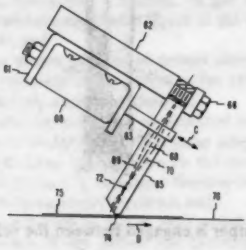
A device for picking up and transferring single plies of sheet material, especially a wide variety of fabric and the like which may be in a stack, comprising a presser foot, a relatively movable work-pinching member cooperative with the presser foot, and means for adjusting the nip of the member and the foot. Threaded means adjustably limits the extent of initial separation of the pinching member and the foot whereby appropriate nipping of different thicknesses and types of material is obtained.

3,747,920
UNLOADER ASSEMBLY
Joseph A. Linkus, Levittown, Pa., assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Apr. 14, 1971, Ser. No. 133,873
Int. Cl. B65h 29/10
U.S. Cl. 271—85 13 Claims



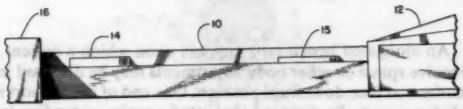
An improved apparatus for operating on sheets of material includes an unloader assembly which engages a sheet of material and removes it from a punch press. Interconnected controls for both the punch press and unloader automatically initiate an unloading cycle upon completion of a punching cycle. Upon initiation of an unloading cycle, a clamp mounted on an unloader trolley is moved into gripping engagement with a leading end portion of the sheet. The trolley is then moved away from the punch press along a path extending over the pile on which the sheet is to be deposited. When the trailing end portion of the sheet has cleared the punch press, the trolley is stopped and the clamp is opened to release the sheet. To prevent interference between the pile of sheets and the trolley, the pile is disposed on a support table which is lowered whenever a detector assembly on the trolley detects that the pile extends above a predetermined height.

3,747,921
DOCUMENT FEED DEVICE
La Verne Frank Knappe, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 28, 1971, Ser. No. 213,053
Int. Cl. B65h 5/04
U.S. Cl. 271—54 11 Claims



The document feed device includes an electromechanical transducer and a coupler element. The electromechanical transducer is used to transform electrical energy into mechanical energy in the form of strain waves in the elastomer coupler element. The coupler element transmits strain waves to the document. The oscillatory motion of the contact surface of the coupler element in cooperation with a confronting surface defining a document path imparts motion in a selected direction to a document disposed therebetween.

3,747,922
PNEUMATIC TRANSPORT TRACK
Eugen Groeber, Salt Lake City, Utah, assignor to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 27, 1971, Ser. No. 212,070
Int. Cl. B65h 29/24; B65g 51/02
U.S. Cl. 271—74 11 Claims



A pneumatic device that receives spaced, singulated lettermail documents in a vertical on-long-edge attitude and transports such documents along a transport track under pneumatic forces is disclosed.

3,747,923
EXERCISE AND AMUSEMENT DEVICE FOR USE IN THE WATER
Harry L. Ung, 446 Hemlock Ave., South San Francisco, Calif.
Filed Oct. 18, 1971, Ser. No. 190,125
Int. Cl. A63b 23/06
U.S. Cl. 272—1 B 2 Claims

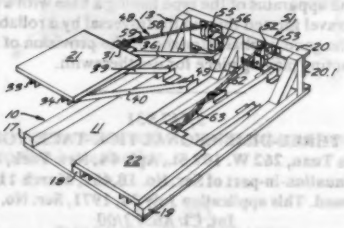
An exercise and amusement device is for use in the water and includes a tethered, air-impervious, soft envelope sym-

metrical about a horizontal axis. Closures at the ends of the envelope keep it air and water tight. Within the envelope are partitions movable with difficulty through some contained water. Included are inner tubes or similar buoyant devices filled with air and assisting to support the envelope on the interior. The device is used very much as a natural log is used in birling.

3,747,924
OUT-OF-PHASE PEDALS OSCILLATED EXERCISING DEVICE

Edmond J. Champoux, 3456 Grandview Hwy., Vancouver, B.C., Canada

Filed Aug. 30, 1971, Ser. No. 176,092
Int. Cl. A63b *23/04*
U.S. Cl. 272—79 R **8 Claims**



Leg exercising device for improving a person's balance having two pedals for accepting the feet, each pedal being hinged on a four-bar mechanism. The pedals are interconnected by a cable passing over a pulley combination so that, by transferring weight from one pedal to the other the pedals oscillate in a vertical plane in 180° out-of-phase relationship, the pedals remaining horizontal throughout oscillation. Change in length of the cable changes the amplitude of oscillation.

3,747,925
SPRING RESISTANT TYPE EXERCISING DEVICE

Robert W. Seeger, 10314 E. Line Oak, Arcadia, Calif.

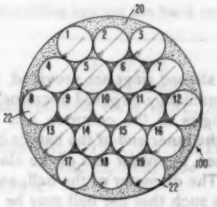
Filed Dec. 20, 1971, Ser. No. 209,919
Int. Cl. A63b *21/22, 21/30, 23/00*
U.S. Cl. 272—83 A **11 Claims**

The exercising device has an elongated shaft with a hand grip mounted on the upper end thereof. The lower end of the shaft is rotatably journaled within a bearing formed in a base. The base is mounted on a pair of legs which also function to support a pair of upright bars. Each bar has an aperture formed at its lower extremity for receiving one of the legs while the upper extremity is adapted to be connected to a spring. A cross bar is provided to extend through the shaft with each end of the cross bar being connected to one of the springs connected to an upright. During an exercise the shaft is twisted by hand with the spring assembly providing a torsional bias against such movement. The uprights supporting the springs are movably mounted on the legs to vary the distance between the uprights and the shaft. This movement varies the tension of the springs to adjust the torsional bias acting on the shaft.

3,747,926
TIC TAC TOE GAME

George P. Odom, Pine Plains, N.Y., assignor to Jeremiah E. Berk, Esq., Poughkeepsie, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,394
Int. Cl. A63b *3/00*
U.S. Cl. 273—130 B **5 Claims**



A game wherein points are awarded by completing rows of matching sets of playing pieces. The game includes a playing surface having a predetermined number of playing areas arranged in rows and a plurality of groups of playing pieces. One playing piece from each plurality of groups is to be placed in each playing area. In one embodiment, translucent colored playing pieces in groups of magenta, cyan, and yellow when placed on top of each other during successive turns, produce additional colors; a player being required to complete a row of a particular color in order to score points. In this embodiment, the playing areas are transparent while the remainder of the playing surface is opaque. In an alternative embodiment, the interrelated groups of playing pieces are concentrically circular, the smallest piece can be a solid circular piece and the next pieces cylindrically-shaped rings in increasing sizes.

3,747,927
GOLF TEE

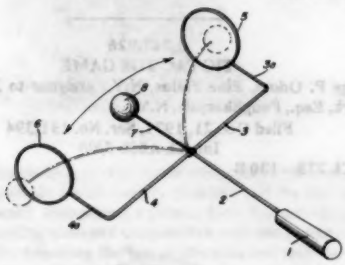
J. Brooks Hoffman, 700 Lake Ave., Greenwich, Conn.

Filed Mar. 17, 1972, Ser. No. 235,577
Int. Cl. A63b *57/00*
U.S. Cl. 273—33 **2 Claims**

A golfer's tee having a generally cylindrical shaft is provided at its ground-penetrating end with a broadened, spade-like

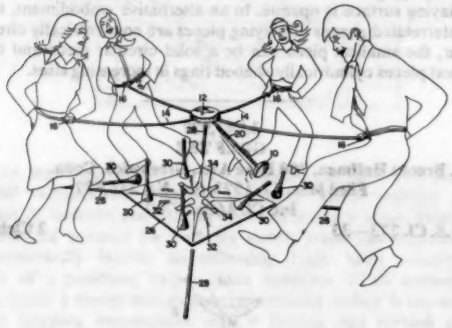
pointed part having at least one concave major surface to facilitate turf repair. The point of the spade-like part is positioned on the center line of the tee shaft.

3,747,928
ELASTICALLY TETHERED BALL AND TARGET RINGS
John H. Spransy, 1701 W. Club Blvd., Durham, N.C., and Brower C. Spransy, 4516 Rynex Dr., Alexandria, Va.
Filed Sept. 22, 1972, Ser. No. 291,238
Int. Cl. A63b 71/02
U.S. Cl. 273—98 **1 Claim**



Two spaced and aligned rings are provided, the same being carried by an intermediately disposed operator's handle which extends at right-angles to the common axis of the aligned rings. Attached to the inner end of the handle is one end of an elastic cord or tether, the other end of the elastic cord being attached to a ball. The diameter of the ball, and the length of the elastic cord are such that the ball may be made to travel through one of the aligned rings and return and pass through the other ring.

3,747,929
PLAYER CONTROLLED TETHERED STRIKING ELEMENT AND PLAYING PIECES
William B. Burke, Springfield, Mass., assignor to Milton Bradley Company, Springfield, Mass.
Filed Sept. 11, 1972, Ser. No. 287,914
Int. Cl. A63b 72/01
U.S. Cl. 273—98 **5 Claims**

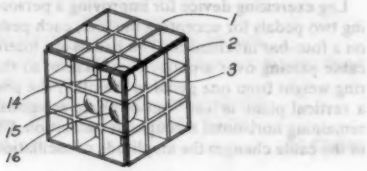


Apparatus for playing a game by teams of players comprising a playing surface appropriately marked to designate the team, playing pieces in the form of pins of different colors for each team, and a striker suspended from cords or ropes attached to the players, the object of the game being to knock down the opponents' playing pieces by movement of the striker.

3,747,930
MAZE GAME APPARATUS
Gordon A. Barlow, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 4, 1970, Ser. No. 95,007
Int. Cl. A63b 67/14
U.S. Cl. 273—113 **2 Claims**

A game apparatus of the type having a base with a maze-like path of travel formed therein for traversal by a rollable playing piece. The game is characterized by the provision of an eccentrically acting playing piece for use therewith.

3,747,931
THREE-DIMENSIONAL TICK-TACK-TOE
Pao-Hwa Tuan, 262 W. 107 St., Apt. 4A, New York, N.Y.
Continuation-in-part of Ser. No. 18,469, March 11, 1970, abandoned. This application July 26, 1971, Ser. No. 166,121
Int. Cl. A63f 3/00
U.S. Cl. 273—130 A **13 Claims**

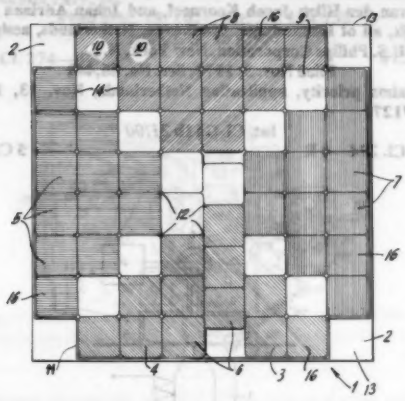


A three-dimensional tick-tack-toe game apparatus which includes a cubical grid structure having 26 separate play making compartments all of which are readily accessible from the sides of the grid structure, the grid structure being an assembled structure of a plurality of partitions or a solid component. Transparent removable covers are provided for each of the grid structure sides. Play markers for use in the respective compartments can be beads, or lights may be embodied in the compartments to denote play with suitable switch controls for the lights also being provided.

3,747,932
BOARD GAME APPARATUS
Vincent Grissino, 83-21 141st St., Kew Gardens, N.Y.
Continuation-in-part of Ser. No. 824,523, May 14, 1969, abandoned.
Filed Nov. 23, 1971, Ser. No. 201,300
Int. Cl. A63f 3/00
U.S. Cl. 273—131 B **12 Claims**

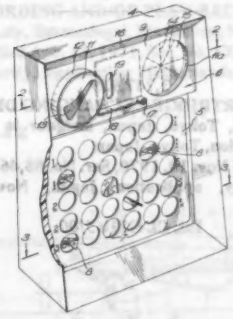
A game board with slideable markers is arranged so that the markers may slide to make the game moves without falling off the board. The markers are differentiated into five sets, four including a playing set for each of four players. A player can only win by achieving his game objective with his particular playing set. The fifth set, a passive set, which may include a corner piece which may not be moved, has pieces which affect the play of each player, but the markers cannot in themselves win for any player. The game is played primarily by sliding the markers individually or in file, including the passive markers, in an available direction. A luck element may be provided

when the number of moves may be determined by chance, such as by the throw of dice. A circumferential barrier holds



the markers on the board and the markers themselves are constructed to slide by each other.

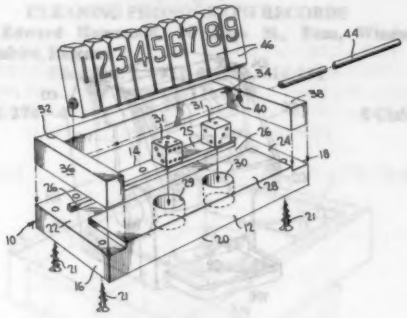
3,747,933
BOARD GAME APPARATUS
Kenneth Frederick Parker, "Kenley," Honeysuckle Ln., Upper Colwyn Bay, Wales
Filed Apr. 24, 1972, Ser. No. 246,970
Claims priority, application Great Britain, Apr. 27, 1971, 11,636/71
Int. Cl. A63f 3/00
U.S. Cl. 273—131 B **9 Claims**



Game apparatus for two players comprising an upright playing or plotting surface which supports movable playing pieces, means for each player for indicating a proposed direction of movement of a playing piece, and means for enabling each player to conceal his directional indicator from his opponent.

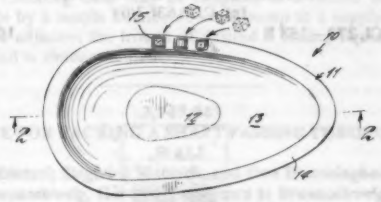
3,747,934
GAME APPARATUS
Gilbert R. Barrett, 4492 Redman, Apt. N, Omaha, Nebr.
Filed Sept. 1, 1971, Ser. No. 176,977
Int. Cl. A63f 3/00
U.S. Cl. 273—135 E **8 Claims**

Game apparatus including a base having side members extending therefrom pivotally supporting a plurality of consecutively numbered rockers, the base having an upper surface with two bores therein for storing dice and a back rest extending from the rear edge thereof, the rockers having a turned down position with the front surfaces thereof engaging the



upper surface of the base and the rear surfaces thereof aligned with the top surfaces of the side members and having an upright position resting against the back rest.

3,747,935
DICE GAME
Nelly D. Engelbrecht, 420 W. 47th St., Apt. C-4, New York, N.Y.
Filed Feb. 9, 1971, Ser. No. 113,901
Int. Cl. A63f 9/04
U.S. Cl. 273—138 R **2 Claims**

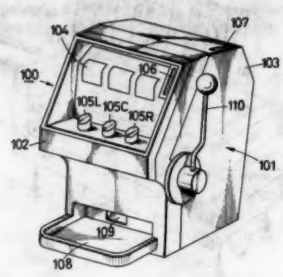


A game device for playing various games such as which employ dice being thrown so to determine the extent of a play or move, the device comprising an open vessel into which dice may be thrown during a play, the open vessel being of any shape, and in one particular design being readily collapsible for convenient storage. The vessel comprises a shell having a flat bottom, an upwardly extending encircling side wall and a flange extending outwardly from the side wall. A recess is provided in the flange for each die. Chalk is provided for keeping score.

3,747,936
MANUALLY ACTUATED AND ELECTRICALLY OPERATED ROTATABLE DRUM CHANCE DEVICE AND SAVING BANK
Haruo Ohki, Tokyo, Japan, assignor to Yoshie Ito, Tokyo, Japan, a part interest
Filed Oct. 6, 1971, Ser. No. 186,951
Claims priority, application Japan, Mar. 16, 1971, 46/14053
Int. Cl. A63f 5/04
U.S. Cl. 273—143 R **4 Claims**

A toy amusement machine and saving bank operable by disposing a disc-like object therein, and pulling an operating

lever so that a plurality of indicia carrying drums are rotated by an electric motor and then depressing push-buttons causing an associated brake to stop corresponding ones of said drums and then again depressing the push-button for drums showing



winning indicia to rock frame members having extensions enterable into notches in the drums to operate mechanism which will discharge a predetermined number of disc-like objects from the machine.

3,747,937

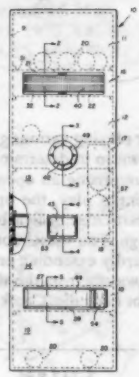
OBSTACLE TOY

Norman Fabricani, Rego Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 20, 1972, Ser. No. 236,320

Int. Cl. A63f *7/04*

U.S. Cl. 273—153 R **10 Claims**



An obstacle toy lets objects fall through a succession of barriers between a top compartment and a bottom compartment when movable shutters in each barrier are properly manipulated. The barriers have upper and lower portals that can receive and discharge an object, and the path between the portals is blocked by a shutter having a recess that is moved between registry with the portals so an object can fall from an upper portal into the recess and be moved to drop through the lower portal.

3,747,938

APPARATUS FOR RECORDING AND/OR PLAYING BACK MAGNETIC RECORDINGS ON OR FROM A FLEXIBLE, IN PARTICULAR TAPE-SHAPED, RECORD CARRIER

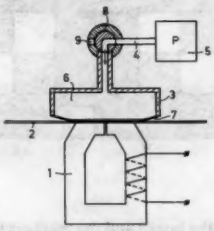
Jan van der Hilst; Jacob Koorneef, and Johan Adriaan Rietdijk, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,441

Claims priority, application Netherlands, Nov. 13, 1969, 6917127

Int. Cl. G11b *21/00*

U.S. Cl. 274—4 R **5 Claims**



An apparatus for recording and/or playing back magnetic recordings on and from a flexible tape- or disc-shaped record carrier, in which there is provided opposite the magnetic head a chamber which is connected to a source of pressure and a wall of which facing the magnetic head is constituted by a diaphragm which is movable towards the magnetic head by an excess pressure in the chamber and by means of which satisfactory contact between the record carrier and the magnetic head is achieved.

3,747,939

TAPE CARTRIDGE EXCHANGING DEVICE

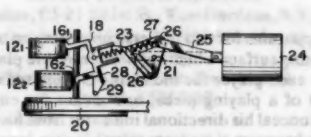
Tadahisa Iwasaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 10, 1970, Ser. No. 88,463

Claims priority, application Japan, Nov. 11, 1969, 44/106410

Int. Cl. G11b *5/00*

U.S. Cl. 274—4 F **5 Claims**



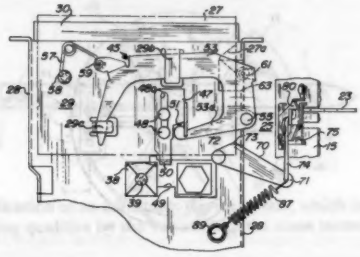
A tape cartridge exchanging device to be utilized on magnetic tape recorders for the purpose of exchanging two tape cartridges inserted into the magnetic tape recorder. The cartridge exchanging device has a forked lever that is activated by a plunger for simultaneously depressing and releasing the respective pinch rollers on a pair of tape cartridges. Spring connections bias the various levers to a neutral position.

3,747,940

TAPE CARTRIDGE EJECTION MECHANISM

Gustav A. Winkler, Wheaton, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 15, 1971, Ser. No. 124,152
Int. Cl. G11b *15/24*
U.S. Cl. 274—4 B 8 Claims



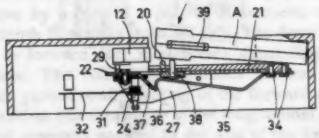
A housing for an electronic-type tape player device has two substantially perpendicular and intersecting outer walls, one of which includes an access opening to an internal cartridge receiving cavity and the other of which contains thereon an actuator member for a tape cartridge ejection mechanism. The actuator member is movable to an actuated position and is linked to an actuated member internal to the housing for correspondingly moving the actuated member. The actuated member is engageable with a bi-stable cartridge lock and release mechanism for moving the same from a first stable cartridge lock position to a second stable cartridge release position with movement of the actuator member to its actuated position thereby to permit an insertable tape cartridge to be removed from the cavity.

3,747,941

TAPE RECORDING AND/OR PLAY-BACK APPARATUS

Piet Van der Lely, Emmasingel, Eindhoven, Netherlands

Filed Apr. 13, 1971, Ser. No. 133,588
Claims priority, application Netherlands, Apr. 29, 1970, 7006246
Int. Cl. G11b *15/24*
U.S. Cl. 274—4 E 4 Claims



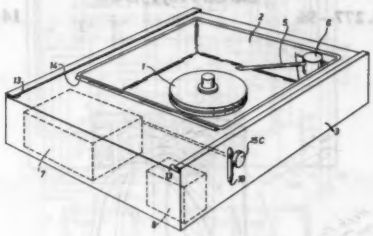
An apparatus for recording and/or playing back magnetic tape recordings from a cassette, is provided with a fixed mounting plate on which are arranged two winding spindles and a capstan. A movable mounting plate, on which are arranged at least one magnetic head and a pressure roller is also provided. The movable mounting plate is locked in a retracted position by a latch member. The latch is released when the cassette is placed on the first mounting plate. The movable plate is thus moved by a spring force into an operating position in which the magnetic heads and the pressure roller project into the cassette. Two ejection keys are provided which are positioned so that they may be operated by the thumb and a finger of one hand to return the movable plate from the operating position to the retracted position. The latch will thereby return to the latching position and simultaneously strike the cassette so that the latter springs from the fixed mounting plate into the palm of the operating hand.

3,747,942

CLEANING PHONOGRAPH RECORDS

Colin Edward Hammond, 90 High St., Eton, Windsor, Berkshire, England

Filed Jan. 7, 1972, Ser. No. 216,141
Int. Cl. G11b *3/58*
U.S. Cl. 274—47 8 Claims



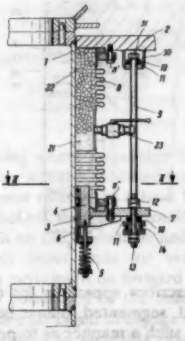
Phonograph records are placed on a turntable and rotated in an anti-clockwise direction. A cleaning fluid, which may be water, an organic solvent or an aqueous detergent solution, is applied to the innermost edge of the grooved recording area. Since the recording groove spirals outwardly in a clockwise direction, the anti-clockwise motion of the turntable causes the cleaning fluid to travel outwardly across the record, carrying foreign matter with it. Waste cleaning fluid may be removed by positioning the turntable in a trough with drainage means. Cleaning fluid may be supplied to a record on the turntable by a nozzle connected via a pump to a supply tank mounted adjacent the trough. If desired a rinsing liquid may be applied in similar manner.

3,747,943

DEVICE FOR PACKING A SHAFT PASSING THROUGH A WALL

Walter Dietzel; Siegfried Matusch, and Uwe Hemminghaus, all of Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Am Alten Bahnhof, Germany

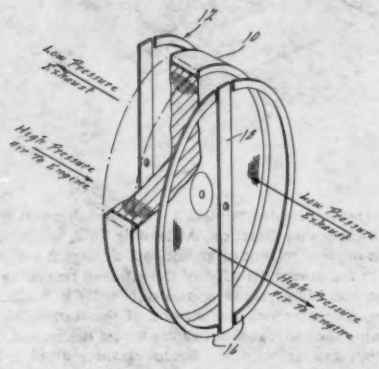
Filed June 23, 1972, Ser. No. 265,428
Claims priority, application Germany, Feb. 23, 1972, P 22 08 407.7
Int. Cl. F16j *15/16*
U.S. Cl. 277—30 9 Claims



A shaft sealing device includes a corrugated pipe extending from a wall through which the shaft extends, the corrugated

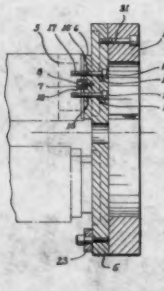
pipe also being affixed to a bushing carrying a bearing. A swivel support for the bushing is provided by bolts mounted in swivel bearings between the wall and flange. Plastic balls may be inserted in the cavity between the corrugated pipe and the shaft.

3,747,944
DRY LUBRICATED MATERIALS, MEMBERS AND SYSTEMS WITH BORON NITRIDE AND GRAPHITE
Amedee Roy, 2661 Cheswick Dr., Troy, Mich., and James M. Geyman, 19706 Old Homestead, Harper Woods, Mich.
Filed Dec. 27, 1971, Ser. No. 212,414
Int. Cl. F16j 15/34
U.S. Cl. 277—96 **14 Claims**

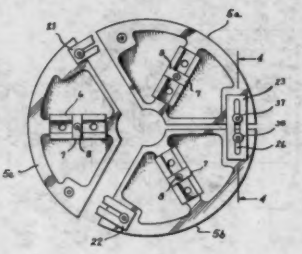


An improved gas turbine regenerator seal system having a new configuration wherein one of the rubbing seal members thereof carries a new material providing an initial working surface comprised of an iron oxide matrix containing an interspersed mixture of boron nitride, nickel coated graphite and sodium sulfate — Na_2SO_4, sodium phosphate — Na_3PO_4, or calcium fluoride — CaF_2.

3,747,945
UNIVERSAL RING JAWS
Vernon Brooks Bailiff, 3608 W. Harmont Dr., Phoenix, Ariz.
Filed Oct. 4, 1971, Ser. No. 185,972
Int. Cl. B23b 31/10
U.S. Cl. 279—1 SJ **6 Claims**

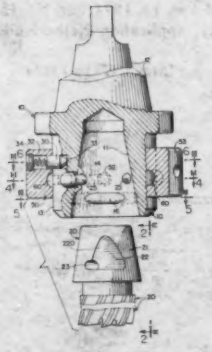


The invention describes apparatus for chucking work in lathes. A pie-shaped, segmented, planar backing plate is attached to a lathe in such a manner as to permit radial movement without affecting the planar orientation of each of the segments. A plurality of segments constituting a ring are attached to the backing plate. This ring is machined to accept the work piece in either an inside diameter or outside diameter relationship. After the work piece is mounted onto the segmented ring, the segments of the backing plate are moved radially inwardly or outwardly, depending on the method of attaching the work piece, to snugly hold the work piece during the machining operation of the work piece. The size of the



backing plate is constricted only by the peripheral equipment about the lathe and is not related to the size of the lathe chuck jaws themselves. Similarly, the size of the segmented ring employed with the backing plate is determined by the inside or outside diameter of the portion of the work piece used in securing the work piece to the segmented ring.

3,747,946
TOOL HOLDERS
Ralph A. Edens, 1007 Lochmoor, Grosse Pointe Woods, Mich.
Filed Dec. 21, 1970, Ser. No. 100,224
Int. Cl. B23q 3/00
U.S. Cl. 279—81 **1 Claim**



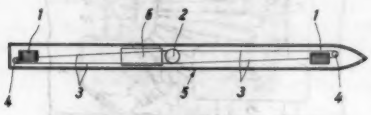
An improvement in quick-lock and quick-release tool holders wherein a compound locking cam and related locking elements are provided which initially lock a tapered shank cutting tool or the like into a complementarily formed holder by a primary manual cam lock followed by a contiguous secondary relatively flat preferably wrench-actuated cam lock whereby to provide more positive and rugged locking than heretofore possible, which compound cam lock is not only more rugged and positive than the heretofore single cam lock, but provides an improved quick-lock and quick-release action together with permitting rotation in main drive and reverse drive directions.

3,747,947

SKI WITH ADJUSTABLE DEVICE

Ernst Werner Gunzel, Waldperlacher Str. 12, D-8000 Munich 83, Germany

Filed Oct. 21, 1971, Ser. No. 191,236
Claims priority, application Germany, Oct. 24, 1970, P 20 52 332.4
Int. Cl. A63c 5/07
U.S. Cl. 280—11.13 F 7 Claims



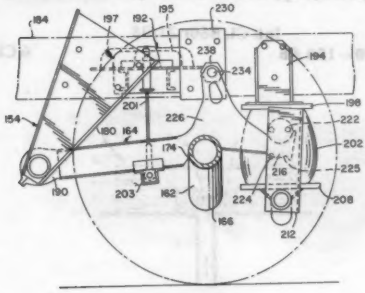
Application of an adjustable device to skis, which influences the skiing qualities by the variation of the mass moment of inertia.

3,747,948

VEHICLE SUSPENSION

Ole Granning, Detroit, Mich., assignor to Granning Suspensions, Inc., Dearborn, Mich.

Division of Ser. No. 45,613, June 12, 1970, Pat. No. 3,689,102.
This application Dec. 20, 1971, Ser. No. 209,640
Int. Cl. B60g 11/00
U.S. Cl. 280—112 R 7 Claims



The vehicle suspension provides an axle assembly which may be mounted either on a truck-tractor or a truck-trailer. The suspension includes an axle which is suspended from the vehicle frame by means of a pair of elastomeric springs. A drawbar extends forwardly from the axle. The drawbar is connected, at its forward end, to structure depending from the vehicle frame. The connection includes resilient fastening means which permit some pivoting of the forward end of the drawbar about an axis transverse to the longitudinal axis of the drawbar and generally parallel to the axis of the axle. Lifting means are provided to raise the axle and associated wheels off the ground when desired. The vehicle suspension is adapted for use as a pusher type axle suspension for mounting on a truck forward of the drive axles thereof.

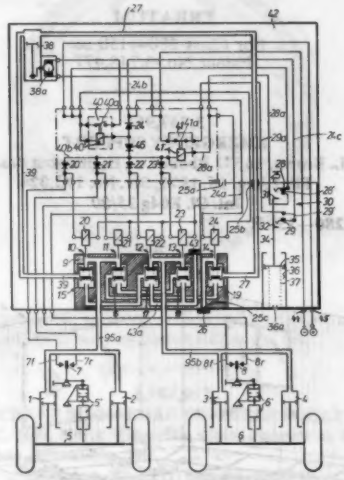
3,747,949

APPARATUS FOR MAINTAINING THE PRESSURE IN A PNEUMATIC SUSPENSION

Ortwin Engler, Gerlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 18, 1971, Ser. No. 125,475
Claims priority, application Germany, Mar. 20, 1970, P 20 13 303.3
Int. Cl. B60g 17/00
U.S. Cl. 280—124 F 10 Claims

At sufficiently high pressure in a closed container, filling of, or discharge from the pneumatic suspension of a motor car is controlled by a level switch whose positions represent different relative positions between a chassis and wheel shafts of a motor car, depending on a load variation. When the pressure in the container drops, a pressure responsive switch causes a control valve to connect the pressure conduit and the suction conduit, of a compressor with the closed container and the outside air, respectively, unless the level switch is operated by load variation. Below a minimum pressure in the container, charging by the container is continued even if the level switch is operated.

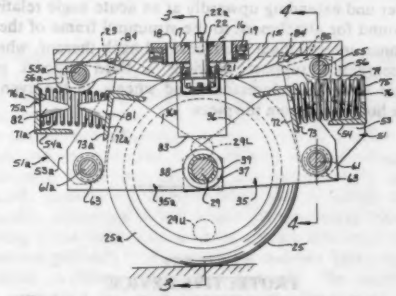


3,747,950

SHOCK ABSORBING WHEEL SUSPENSION

Clarence H. Hager, Rockford, Ill., assignor to Modern Caster Co., Rockford, Ill.

Filed Nov. 30, 1971, Ser. No. 203,324
Int. Cl. B62d 53/00
U.S. Cl. 280—124 A 15 Claims



A shock absorbing wheel suspension for vehicles in which the ground engaging wheel is mounted for limited vertical and horizontal movement relative to a base by forward and rear wheel support brackets that are pivotally interconnected at their adjacent ends on the wheel axle and which are pivotally supported at their outer ends for vertical swinging and horizontal shifting movement on forward and rear suspension brackets pivotally connected to the base. Forward and rear spring assemblies are arranged to engage the forward and rear wheel support brackets to yieldably bias the wheel support brackets angularly in a direction to oppose upward movement of the wheel assembly and to also yieldably bias the forward and rear wheel support brackets horizontally in relatively op-

posite directions to a centered position. The mounting base is adapted to be supported for turning movement about an upright axis vertically aligned with the wheel axis when the latter is in its centered position to provide a steerable wheel assembly.

ERRATUM

For Class 280—150 see:
Patent No. 3,748,477

3,747,951
EMERGENCY SUPPORT

Marvin L. Brown, 16332 Rhone Ln., Huntington Beach, Calif.

Filed Aug. 16, 1971, Ser. No. 172,024
Int. Cl. E04g *25/00*
U.S. Cl. 280—150 R **5 Claims**

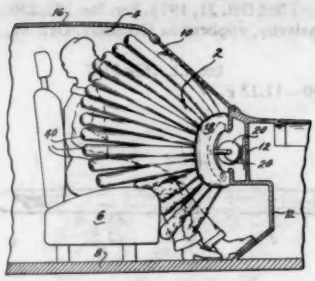
There is disclosed an emergency support for a structure such as a mobile home of the type normally having wheels on opposite sides thereof, adjacent the back thereof, and a structural frame on the bottom thereof, which frame normally rests on piers which support the mobile home above the ground. The present emergency support includes a base member adapted to contact the ground, at least one leg connected to the base member and extending upwardly for attachment to the structural frame of the mobile home, adjacent the front thereof, at spaced points on opposite sides of the longitudinal centerline thereof, and a pair of legs connected to the base member and extending upwardly at an acute angle relative to the ground for attachment to the structural frame of the mobile home, intermediate the front and back thereof, whereby the emergency support provides a third support point, together with the beforementioned wheels, in the event the mobile home falls from the piers.

3,747,952
PROTECTIVE DEVICE

Robert H. Graebe, 4 Signal Hill Blvd., East St. Louis, Ill.

Filed Sept. 17, 1971, Ser. No. 181,438
Int. Cl. B60n *21/08*
U.S. Cl. 280—150 AB **15 Claims**

A protective device for occupants of vehicles includes a manifold disposed in front of passengers and connected with a source of high pressure gas. The manifold has closely spaced ports facing the passengers and may be covered with a padding material having outwardly opening pockets at the ports. The pockets contain flexible tube elements which are connected to the ports and are normally deflated and compacted into the pockets. When the vehicle experiences a collision, the high pressure gas is generated or released and inflates the tube elements, causing them to expand from the pockets and form a protective cushion in front of the passengers. This cushion has little or no fabric or surface tension forces and

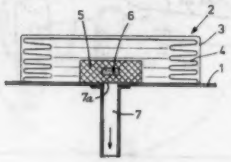


when used with proper valves or tube element shapes can provide controlled retarding force.

3,747,953
SAFETY DEVICE FOR VEHICLE OCCUPANTS

Friedrich Goes, Wolfsburg; Ulrich Seiffert; Dieter Hinzmann, both of Braunschweig, and Gunnar Borenius, Fallersleben, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Nov. 1, 1971, Ser. No. 194,717
Claims priority, application Germany, Nov. 14, 1970, P 20 56 101.7
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **6 Claims**



A safety device for preventing injury to vehicle occupants upon the occurrence of a collision. The device includes an inflatable bag, a source of gas for rapidly inflating the bag, a triggering mechanism for actuating the gas source and an exhaust vent in communication with the bag interior for venting inflation gases from the bag in a controlled manner. Venting may be concurrent with the inflation process, or may be delayed by use of a valve openable at a predetermined pressure or by initially sealing the vent inlet with a combustible, solid fuel element that allows gas to escape through the vent after a period of combustion. The same fuel element also constitutes the gas source of the device.

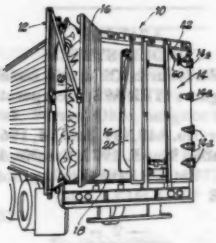
3,747,954
PNEUMATIC VEHICLE LADING SYSTEM MOUNTED ON SWINGABLE DOOR

Samuel H. Enochian, Thornton, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Sept. 13, 1971, Ser. No. 179,801
Int. Cl. B60p *7/00*
U.S. Cl. 280—179 R **6 Claims**

The typical swing doors that form the rear wall of a truck-drawn trailer are provided with simple freight-engaging panels that are selectively biased against the lading by inflatable envelopes disposed between the panels and the doors. The

source of gas or compressed air is communicated to the inflatable bags by means of a pivotable connector that permits



the modified doors to be used as normal doors while providing a reliable supply of pressurized gas to the inflatable envelopes.

3,747,955

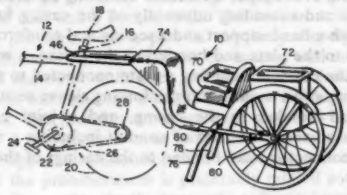
TANDEM TRAILER FOR A BICYCLE

Alexander D. MacAlpine, 50 N. Main St., Natick, Mass.

Filed Dec. 23, 1971, Ser. No. 211,456

Int. Cl. B62k *27/12*

U.S. Cl. 280—204 **9 Claims**



A tandem trailer designed to be detachably attached to a bicycle wherein the trailer comprises a frame provided with upper and lower horizontal frame members joined by a vertical frame member such that wheels mounted on the lower frame member support the upper frame member in a substantially horizontal position above the rear wheel of a bicycle so that the bicycle and frame are free to turn relative to each other, the upper frame member having a loop adapted to be placed about the seat ahead of the seat post, a fixed pivot pin mounted on the top bar of the bicycle frame forwardly of the seat post on which the loop is adapted to be pivotally impaled, and spring-biased clips adapted to releasably hold the loop on the pin.

3,747,956

SPHERICAL VEHICLE

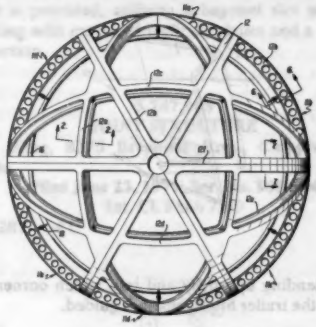
Harold V. Heberlein, Box 269, Reverton, Wyo.

Filed Nov. 22, 1971, Ser. No. 201,056

Int. Cl. A63g *29/00*

U.S. Cl. 280—206 **10 Claims**

A vehicle of a generally spherical configuration is disclosed for receiving therein and conveying a person. Within the spherical vehicle, there is disposed a handrail suspended by a plurality of springs from the sphere and a support jacket for supporting the person within the vehicle. The supported person may propel the spherical vehicle by fore and aft, and vertical and horizontal body movements upon the rail.



3,747,957

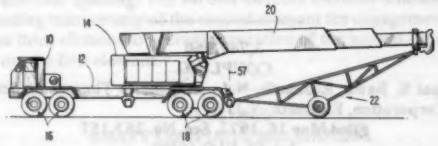
CRANE BOOM LOAD TRANSFER DOLLY

George C. Noll, North Ridgeville, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Filed Apr. 29, 1971, Ser. No. 138,524

Int. Cl. B62d *53/04*

U.S. Cl. 280—404 **13 Claims**



A vehicle for supporting and transporting a crane having a boom element extending therefrom and a boom load transfer dolly. The boom load transfer dolly is a single axle, wheeled frame structure having two lever arm, load transmitting sections respectively adapted to engage a tractor portion of the vehicle and the extended boom element in load transmitting relationship. The lever arms of the transfer dolly may be generally pyramidical truss sections one of which may be releasably connected to the tractor for permitting horizontal pivoting of the dolly relative to the tractor. The other section includes a generally U-shaped saddle member which supports the boom in sliding relationship therewith. The saddle is in turn connected for pivotal movement with respect to the transfer dolly.

3,747,958

HITCHING GUIDE AND SHIELD

Chester E. Hackett, 104 Isthmus, Coos Bay, Oreg.

Filed June 14, 1971, Ser. No. 152,782

Int. Cl. B60d *1/00*

U.S. Cl. 280—477 **1 Claim**

A shield for use in conjuction with a trailer hitch, the shield being adaptable for guiding the front end of a trailer hitch tongue into alignment over a hitch ball, the device comprising a one piece member including a diamond shaped bottom wall with a transverse extending slot there through for being

mounted on the trailer wall shaft, and the member including a pair of angularly upstanding walls to form a corner there

between extending upwardly and into which corner the forward end of the trailer hitch tongue is guided.

3,747,959

NUCLEAR FUEL ELEMENT IDENTIFICATION METHOD

John T. Hunt, Pittsburgh, Pa., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed July 21, 1971, Ser. No. 164,760
Int. Cl. B42d *15/00*
U.S. Cl. 283—7 1 Claim

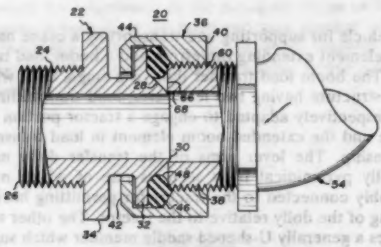
Individual objects are identified within a multiplicity of the objects by an identification method which comprises establishing a first selected number of markable positions on each of the individual objects and placing a second selected number of identical identifying marks within the markable positions. The location of the second number of marks within the markable positions on each of the objects serves to identify that object within the multiplicity.

3,747,960

COUPLING

Jaspal S. Bawa, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed May 15, 1972, Ser. No. 253,157
Int. Cl. F16l *19/00*
U.S. Cl. 285—39 16 Claims



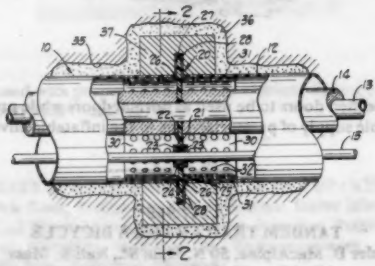
A coupling positionable intermediate the threaded end of a pipe or fitting and a threaded opening where, for example, the manipulation of such pipe or fitting is either limited or restricted in such manner as to prevent direct coupling to the threaded opening. An internally threaded gland nut having a selectively tapered interior portion is rotatably connected to the externally threaded portion of a body member having a selectively tapered external portion spaced from the gland nut tapered portion to provide a selectively formed annular chamber within which is disposed a resilient seal means in the form of an annular ring. Both the seal means and the body member tapered portion are proportioned for contacting engagement with a leading edge of the threaded pipe or fitting advanced into the coupling to provide a controlled seal between the coupling and the fitting or pipe. The gland nut and body member, or selective portions thereof, may be formed of plastic or metallic material, the latter providing means for establishing a metal-to-metal contact and grounding path between the pipe or fitting and the coupling.

3,747,961

CONDUIT SYSTEM

Robert O. Couch, Wadsworth, Ohio, and Donald K. Spalding, Bangor, Pa., assignors to Ric-Wil, Incorporated, Brecksville, Ohio

Continuation of Ser. No. 848,389, July 14, 1969, abandoned.
This application May 5, 1971, Ser. No. 140,561
Int. Cl. F16l *47/00*
U.S. Cl. 285—133 R 19 Claims



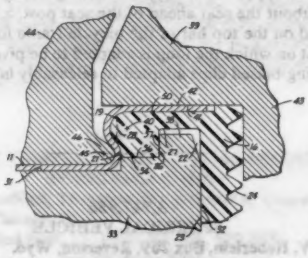
A prefabricated conduit system comprising a fluid-conducting pipe supported within and extending through a reinforced plastic casing, a conduit anchor for restricting longitudinal movement of the pipe, the anchor including a plate secured to the pipe and extending outwardly of the casing for engagement with a fixed support and a sealing and reinforcing sleeve secured to the plate and bonded to the casing, a seal for the end of the conduit including a plate connected to the end of the casing and a sealing and reinforcing sleeve secured to the plate and bonded to the casing, and a joint connection between adjacent sections of conduit including a reinforced plastic connector band bonded to the casings of the adjacent sections.

3,747,962

PLASTIC CLOSURE-RECEIVER FOR METAL CONTAINER

George F. Bauman, Auburn, Ind., assignor to Rieke Corporation, Auburn, Ind.

Continuation of Ser. No. 25,031, April 2, 1970, abandoned.
This application May 5, 1972, Ser. No. 250,840
Int. Cl. F16l *41/00*
U.S. Cl. 285—202 7 Claims



A plastic receiver is internally threaded for reception of a plug. The receiver is provided with a radially extending flange with a downwardly opening channel on the underside thereof, an interior cylindrical wall of the channel serving as a back up face for a back up ring of an installation die, precluding col-

lapse of the flange upon die forming of a retaining pocket of a metal container member upon flange installation. Circularly spaced irregularities provided on the upper outer surface of the flange effect matching deformations of the metal during installation, precluding subsequent rotation of the flange in the metal.

3,747,963

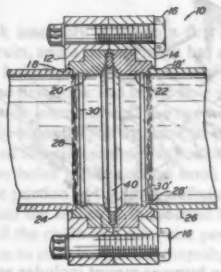
HIGH VACUUM FLANGE ASSEMBLY WITH O-RING GASKET

Robert A. Shivak, Parma, Ohio, assignor to Cajon Company, Solon, Ohio

Continuation-in-part of Ser. No. 191,195, Oct. 21, 1971, abandoned. This application May 17, 1972, Ser. No. 254,292

Int. Cl. F16l 23/00

U.S. Cl. 285—336 **8 Claims**



A vacuum joint construction wherein opposed flange faces each include an inwardly extending recess having an outer peripheral wall and a bottom wall. The bottom wall in each recess is provided with a pari of relatively closely spaced protuberances which extend about the bottom wall radially inwardly of the outer wall. Each protuberance is defined by a pair of side walls and has a height less than the height of the outer wall. The protuberances are each shown as having the shape of a one-quarter torus with their convex faces positioned in opposed relationship. The radial space between the apices of the protuberances is preferably related so as to be substantially equal to the thickness of a soft metal gasket to be positioned between two opposed faces. Also disclosed is the use of a metal O-ring gasket having a surface coating or layer of a soft metal such as silver. The O-ring is sized such so that on joint make-up, the convex faces of the protuberances wipingly engage its surface.

3,747,964

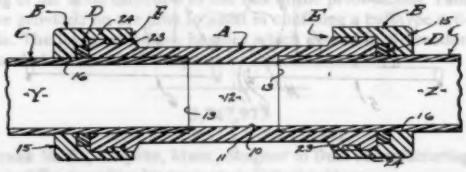
QUICK COUPLING AND SEAL

Norman P. Nilsen, Jr., P.O. Box 33, Phelan, Calif.

Filed Dec. 15, 1971, Ser. No. 208,370

Int. Cl. F16l 17/00

U.S. Cl. 285—337 **12 Claims**



A coupling and seal for fluid conducting piping and particularly adapted to plastic pipe, to quickly couple sections thereof, and utilizing elastomeric seal rings pressed so as to frictionally engage onto one tubular member to thereby connect it to a second tubular member. The invention resides primarily in a tubular coupling member and cooperating nut which together form a ring groove in which a seal is pressed and/or pressured so as to constrict onto the said second tubular member. A feature is the quick make and break connection that is provided, utilizing a bayonet slot with nut lugs cooperating with extended inclined planes and a stop to limit seal distortion.

3,747,965

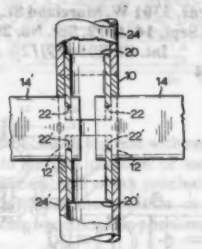
JOINT STRUCTURE

Howard Wing, 8370 Breadnor Cres., Chippiwa, Ontario, Canada

Filed June 22, 1971, Ser. No. 155,594

Int. Cl. F16b 7/00

U.S. Cl. 287—54 C **3 Claims**



The invention provides a joint structure for use in making articles of furniture suitable for assembly in the home. The joint structure consists of a first element having an axial opening and a transverse opening, a second element for engagement in the transverse opening, and a third element engageable in the axial opening for locking the second element in the transverse opening. The second element includes a notch extending transversely of the second element for engagement by the third element to prevent separation of the second element from the first element.

3,747,966

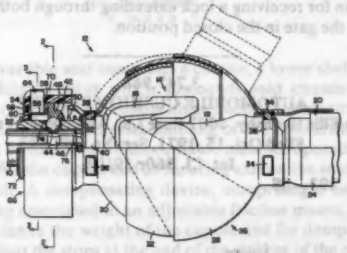
SHAFT COUPLING MECHANISM

Raymond Steele Wilkes, Ottumwa, Iowa, and Homer D. Witzel, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Sept. 15, 1971, Ser. No. 180,603

Int. Cl. F16d 1/00

U.S. Cl. 287—119 R **21 Claims**



Mechanism for coupling an externally splined power take-off shaft with a hollow internally splined shaft, comprising a plurality of locking elements radially movable between inner locking and outer unlocking positions within a like plurality of circumferentially spaced apertures in the wall of the hollow shaft, the elements being engageable in the former position with a circumferential groove in the power take-off shaft to lock the shafts against relative axial movement. A retaining member is axially slidable on the periphery of the hollow shaft between a first position wherein it surrounds the locking ele-

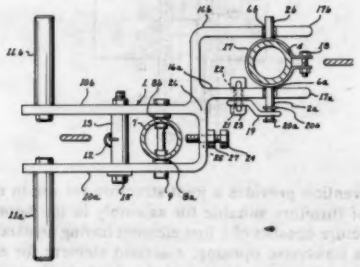
ments and prevents their disengagement from the groove in the power shaft and a second position wherein the elements are free to move to their unlocking position, the member being biased toward the former position. A latch ring on the hollow shaft is operable to move the retaining member from its first to its second position, and is engageable with a recess in the periphery of the hollow shaft to lock the member in the latter position. As the hollow shaft is inserted onto the power take-off shaft, the latter engages and moves the locking elements radially outwardly against the latch ring, thereby disengaging the ring from the recess in the hollow shaft and permitting the retaining member to move back toward its first position.

3,747,967

ROLL GATE LATCH

William F. Edwards, 3301 W. Moreland St., Phoenix, Ariz.

Filed Sept. 14, 1972, Ser. No. 289,010
Int. Cl. E05c *19/12*
U.S. Cl. 292—104 **3 Claims**



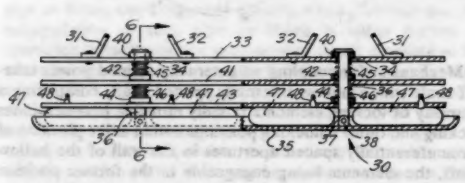
A latch for a roll gate including a latch unit support on the gate for detachably coupling with a sleeve-supported latch pin pair extending diametrically oppositely outwardly from a stationary vertical fence post. The latch unit includes a pair of levers viewed together, each one of which is disposed on opposite sides of the roll gate post, the unit pivotally fixed thereto. One end of the latch unit is provided with handle means and the other end is notched along angled surfaces to receive the latch pins. Spring biasing means urge the latch unit to the locked position, and the handles may be operated in such a manner that the unit is pivoted to withdraw the notches from engagement with the latch pin to open the gate. One of the levers at the notched end thereof is provided with an opening for alignment with a lock arm secured to the fence post latch pin for receiving a lock extending through both elements to lock the gate in the closed position.

3,747,968

AUTOMOBILE CUSHION BUMPER

Guyton Ellis Hornsby, 4001 Rose Ln., Annandale, Va.

Filed Oct. 15, 1971, Ser. No. 189,593
Int. Cl. B60r *19/10*
U.S. Cl. 293—88 **1 Claim**



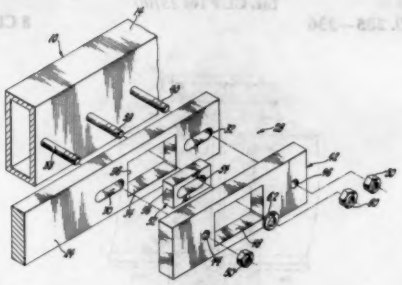
An automobile cushion bumper in which an inner bumper bar and an outer bumper bar are separated by a plurality of air bags positioned to absorb the shock of a collision on the outer bumper bar. In a modified form of the invention a plurality of bumper bars are separated by shock absorbing springs with the outer pair of bumper bars being separated by a plurality of air bags for absorbing the shock of collision.

3,747,969

ENERGY ABSORBING BUMPER MOUNT

James H. Diener, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1971, Ser. No. 118,637
Int. Cl. B60r *19/04*
U.S. Cl. 293—89 **1 Claim**



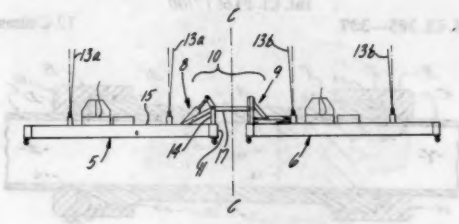
A vehicle collison bumper mount includes serially actuated primary and secondary energy absorbing units. The primary unit includes a strut rigidly projecting from a bumper bar and a friction pad operative to clamp the strut to the chassis frame, the strut being slidable relative to the chassis frame and the friction pad and against the uniform resistance of mechanical friction to effect primary energy absorption. The secondary unit includes a slidable contact member clamped to the chassis frame in spaced relation to the strut. After a predetermined amount of sliding movement during primary energy absorption the strut engages the contact member and forces the latter to slide as a unit therewith so that the frictional resistance to sliding of the contact member effects additional or secondary energy absorption.

3,747,970

CONTAINER-SPREADER SPACING APPARATUS

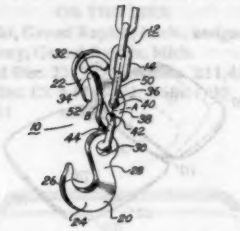
Jack E. Fathauer, Roxboro, N.C., and Carl R. Gottlieb, Mobile, Ala., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 17, 1972, Ser. No. 218,372
Int. Cl. B66c *1/10*
U.S. Cl. 294—81 SF **5 Claims**



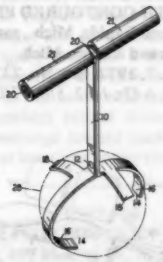
Apparatus shared by two spreaders capable of spacing the spreaders during simultaneous confronting vertical movements while supported on cables from a crane. The apparatus includes a horizontally-adjustable abutment carriage on one spreader and a swing-away bumper member mounted on the other spreader.

3,747,971
CHAIN HOOK ASSEMBLY
Lyle L. Yake, R. R. No. 1, Salem, Ind.
Filed Apr. 22, 1971, Ser. No. 136,420
Int. Cl. F16g *17/00*
U.S. Cl. 294—82 R **4 Claims**



A chain hook assembly in which a first hook has a shank with a hole therein, and a second hook has a shank with a part containing two holes spaced longitudinally therealong. A link in the hole in the first hook and in the hole nearer the free end of the second hook interconnects the two hooks and a chain is connected to the second hook by a link in the other of the two holes. The line of force from the first hook to the chain passes through the two holes in the second hook and laterally outwardly from the portion of the hook defining the throat of the second hook, and the throat of the second hook is of a size to receive a link of the chain in a side-wise position without permitting the chain to slide lengthwise therethrough.

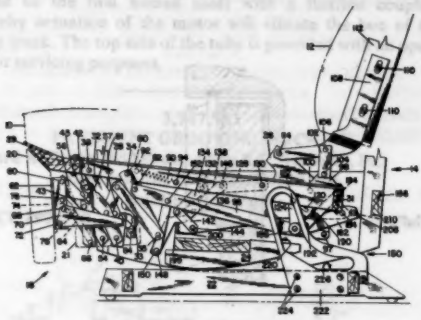
3,747,972
TONGS
Kendall E. Mespelt, 945 S. Ermine, Albany, Oreg.
Filed Mar. 30, 1971, Ser. No. 129,471
Int. Cl. B25b *7/02*
U.S. Cl. 294—118 **1 Claim**



A pair of tongs particularly designed for handling ball type articles such as ball valves. A pair of lever arms are pivotally connected and have jaws which extend downwardly from the lower end of the arms. The jaws are contoured outwardly relative to the longitudinal plane of the lever arms to form upright gripping areas, with the contour of the gripping areas extending in the same direction as the axis of the pivot means. Tabs are provided on the jaws to assist in confining a ball type article. The lever arms have handles which extend in a direction parallel to the axis of the pivot means.

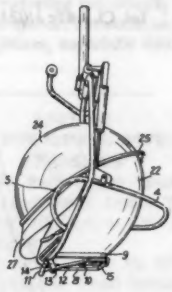
3,747,973
ROCKER/RECLINER CHAIR
Frank M. Re, Holyoke, Mass., assignor to Dual Manufacturing and Engineering, Incorporated, Holyoke, Mass.
Continuation-in-part of Ser. No. 884,187, Dec. 11, 1969. This application Sept. 8, 1970, Ser. No. 70,269
Int. Cl. A47c *1/035*
U.S. Cl. 297—84 **5 Claims**

A rocker/recliner chair inclusive of a rocker base, a chassis rockably connected to the base, a body-supporting unit (i.e. a seat and a back) connected to the chassis, a leg rest, and mechanism interconnecting the body-supporting unit and leg rest and chassis for coordinated rocking and reclining motions of the body-supporting unit and extending or retracting of the leg rest, and arresting means which permits rocking of the



chassis and seat and back and leg rest with respect to the base when the chair is in upright position or moving into intermediate reclined position, and which precludes rocking as the chair assumes an intermediate position or is in the intermediate or fully reclined positions or positions therebetween.

3,747,974
CONVERTIBLE SEAT FOR CABLEWAYS
Francis Tauzin, Veyrins, France, assignor to Pomagalski S.A., Grenoble and Sigma Plastique, Veyrins, France
Filed June 25, 1971, Ser. No. 156,797
Int. Cl. A49b *19/00*
U.S. Cl. 297—184 **7 Claims**

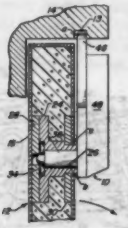


The convertible seat comprises a chassis, a lower shell forming a sheilding bucket which surrounds said chassis and a transparent hemispheric cupola hinged about a diametral axis. A rapid assembling and disassembling of the convertible seat is obtained by means of a dismountable member operating as a hinge axis for the cupola and as securing axis on the seat frame for the shell. A compensating device, comprising a compensating spring associated to an adjustable friction means, is provided to balance the weight of the cupola and for damping the shocks against the stops at the end of the strokes of the cupola.

3,747,975
FASTENER
Eugene R. McGregor, Morris, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Nov. 8, 1971, Ser. No. 196,375
Int. Cl. A47c *7/62*; E05c *3/04*
U.S. Cl. 297—191 **6 Claims**

Turn type fastener for seat-back tray table is assembled to a blind hole in the tray bottom surface and is locked thereto

against unauthorized axial movement by a snap type fastening means located partially on the turn type fastener shaft and partially in a bearing member in the hole. The turnable fastener is rotatable into locking engagement with an opening in the seat back and is formed with outwardly conveying



gripping portions which permit the fastener to be easily manually rotated but render it difficult to apply an outward pulling force to it. Although the fastener can be pried out of its bearing near its pivot shaft when replacement is necessary, a pulling force applied at the end of its radial handle will merely cause the pivot shaft to bind against its bearing.

3,747,976

SEATS

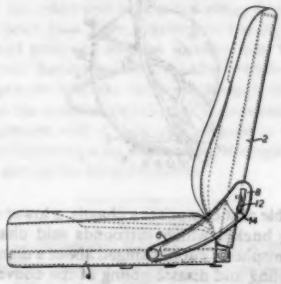
Robert Ronald Lacey, Northampton, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 25, 1971, Ser. No. 109,105

Claims priority, application Great Britain, Jan. 30, 1970, 4,520/70

Int. Cl. A47c *1/025*

U.S. Cl. 297—361 **8 Claims**



A seat back adjustment means utilizing a pivoted arm between the seat part and the back part and a rack and pinion arrangement at one end of the arm connects to one of the parts to provide an effective change of length of the arm so as to thereby adjust the angle of the seat back. Preferably the rack is formed in a rear portion of an arcuate slot such that weight against the seat back tends to hold the teeth of a pinion member in the rack portion.

ERRATUM

For Class 297—440 see:
Patent No. 3,748,012

3,747,977

SEATING UNIT

David L. Rowland, 8 E. 62nd St., New York, N.Y.

Division of Ser. No. 889,155, Dec. 30, 1969. This application Sept. 9, 1971, Ser. No. 179,123

Int. Cl. A47c *1/12, 5/00, 7/02*

U.S. Cl. 297—445 **4 Claims**

A cushion assembly having a seat portion and a back portion joined together. Each portion comprises an inner cover filled with resilient stuffing, an upholstery fabric outer cover, and a stiffening member inside the stuffing is inside the inner cover of the back portion. The stiffening member has a plurality of cloth tabs secured to the inner covers of both the seat portion and the back portion, and each portion is sewn together by a seam whose thread is passed through the tabs. These tabs serve not only to keep the stiffening member in place but also as cloth hinges joining the seat portion to the back portions. The stiffening member is a sheetlike member of generally rigid material and prevents the cushion from being bent back more than a certain amount so that it provides support even where the seat or sofa on which the cushion is placed has a low back.

3,747,978

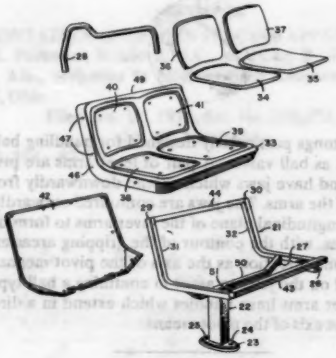
TRANSIT SEAT WITH CONTOURED PLASTIC SHELL

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Mar. 7, 1972, Ser. No. 232,430

Int. Cl. A47c *1/12, 5/00, 7/00*

U.S. Cl. 297—445 **5 Claims**



A two-passenger seat for public transportation vehicle includes a frame of rectangular tubing with a recessed seat area for receiving a one-piece molded plastic shell which is provided with contoured seat and back areas for each of two side-by-side passengers. A single pedestal having a rectangular cross section elongated in the fore-and-aft direction is located beneath the seat spaced inwardly of the aisle end. Separate replaceable cover inserts are received in the seat and back

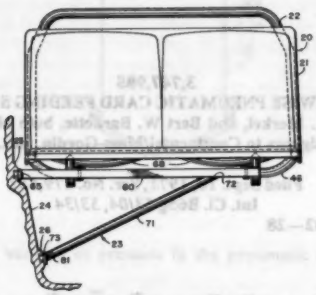
contoured portions which act to retain passengers in place during turns while providing versatility and modification possibilities in seat and back covers.

3,747,979

CANTILEVERED SEAT FOR MOTORCOACH VEHICLES OR THE LIKE

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Dec. 23, 1971, Ser. No. 211,423
Int. Cl. A47c *7/02*; B60n *1/00*
U.S. Cl. 297—451 14 Claims



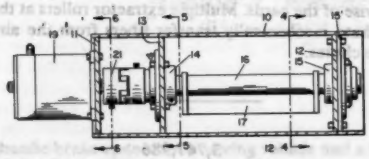
A two-passenger seat is supported by a lower cantilever frame which comprises a horizontal seat frame and an inclined truss support frame. The horizontal seat frame includes two elongated horizontal stretcher tubes attached at one end to the wall of a vehicle and at least two cross frame members interconnecting the stretcher tubes at laterally spaced locations. The inclined truss support frame is located beneath the horizontal seat frame; and it includes fore and aft inclined frame members rigidly attached a their upper ends to the stretcher tubes respectively at locations on the aisle side of the transverse center of the horizontal seat frame. The inclined support frame members extend downwardly from the seat frame and they converge toward each other. They are connected to the wall at locations above the floor of the vehicle.

3,747,980

VIBRATOR FOR DUMP TRUCKS

Harold H. Hansen, 401 Monroe Pl., Minnetonka, Minn.

Filed Dec. 10, 1971, Ser. No. 206,744
Int. Cl. B60p *1/58*
U.S. Cl. 298—1 V 1 Claim



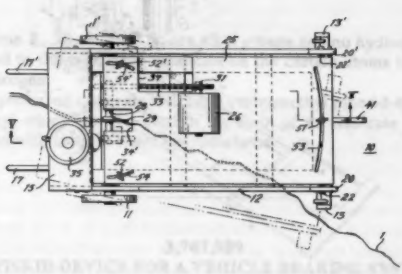
A vibrator for the box of a dump truck is formed with an elongated square metal tube within which are welded three spaced apertured plates with the first plate at one end of the tube, the second plate adjacent to the other end of the tube and the third plate between the other two and nearer to the first plate. An apertured disk is bolted to the second plate and aligned bearings are secured, respectively, to the third plate and the disk for rotatably supporting a shaft. Carried by the shaft between the bearings is a weight which is eccentrically mounted with respect to the axis of the shaft. Bolted to the outer face of the first plate is an electric motor with its shaft projecting through the aperture in the first plate and connected to the first named shaft with a flexible coupling whereby actuation of the motor will vibrate the box of the dump truck. The top side of the tube is provided with an opening for servicing purposes.

3,747,981

PAVEMENT GROOVING MACHINE

Edward A. Zuzelo, 652 Broad Acres Rd., Narberth, Pa.

Filed July 28, 1970, Ser. No. 58,916
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 15 Claims



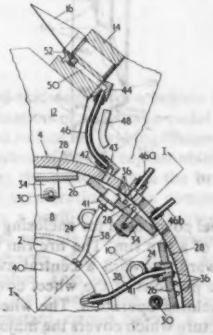
A saw machine having a rotary abrasive blade for working a groove in pavement or the like is provided with means for laterally swivelling movement about the blade. The machine is adapted to be swivelled bodily, as during use as a pavement crack router, or to be propelled straight ahead. The blade support is adapted to be swivelled individually to an acute angle with regard to the fore-and-aft direction, as for flaring the top edge of a pavement groove, especially with a blade having a tapered edge.

3,747,982

ROTARY CUTTER FOR MINING WITH FLUID SUPPLY CHAMBERS

James Malcolm Agnew, Burton upon Trent; Albert Graham French, Willington, and David Arthur Tate, Burton upon Trent, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed June 28, 1971, Ser. No. 157,541
Claims priority, application Great Britain, July 24, 1970, 35,969/70
Int. Cl. E21c *35/22*
U.S. Cl. 299—81 4 Claims



A rotary cutter head for a mineral mining machine, has a hub for mounting on a driven machine shaft, a drum secured

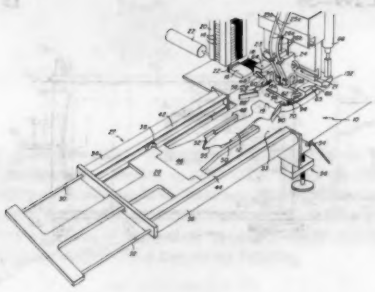
around the hub and cutter tool holders secured around the drum, the head being provided with a plurality of angularly arranged chambers for dust suppression fluid, each extending axially along the inner periphery of the drum and arranged to feed fluid from a distribution unit adjacent to the hub towards the cutting zone of the head.

3,747,983

APPARATUS AND METHOD FOR ASSEMBLING BRUSHES AND THE LIKE

William S. Hodgson, Hingham, Mass., assignor to South Shore Machine Co., Inc., Braintree, Mass.

Filed Oct. 12, 1971, Ser. No. 188,381
Int. Cl. A46d *3/08*
U.S. Cl. 300—21 **25 Claims**



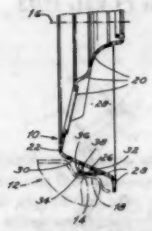
This disclosure depicts assembling apparatus and methods which are especially useful in joining a handle with a brush head or the like having an open-ended ferrule into which an end of the handle is inserted. In order to facilitate insertion of the handle into the ferrule, the ferrule is first compressed to distort its cross-sectional configuration such that it mates more closely with the cross-sectional configuration of the handle end. Other novel features and method steps are disclosed.

3,747,984

PLASTIC WHEEL COVER

Eugene Walter Andrews, Livonia, Mich., and Donald Robert Klein, Greenville, Ohio, assignors to Sheller-Globe Corporation, Toledo, Ohio, by said Klein and Ford Motor Company, Dearborn, Mich., by said Andrews

Filed Mar. 1, 1971, Ser. No. 120,024
Int. Cl. B60b *7/00*
U.S. Cl. 301—37 P **7 Claims**



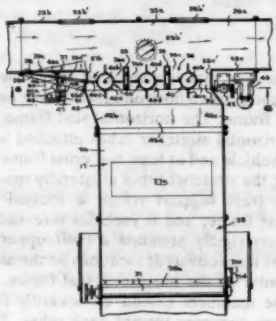
A plastic wheel cover used for enclosing and decorating the central portion of a tire rim. The tire rim has an annular tire bead facing inwardly toward a central axis of the rim. The principal plastic portions of the wheel cover are formed in a single plastic molding operation. The wheel cover includes a decorative structure which covers the major portion of the tire rim. The cover also includes support structure which defines an annular continuation of the cover's decorative structure. The support structure provides an annular surface generally facing toward and in juxtaposition to the rim's tire bead. A plurality of retention fingers extend from the annular surface of the support structure along axes generally parallel to the central axis of the rim. The free ends of the retention fingers are received in the bead of the tire rim to retain the cover on the tire rim. The decorative structure, the support structure and the retention fingers are formed as a single unit in a plastic molding operation. Subsequent to the molding operation, the plastic wheel cover may be covered either wholly or partly with an electroplated coating to provide the wheel cover with an appearance that it is constructed either wholly or partly of metal.

3,747,985

CROSSWISE PNEUMATIC CARD FEEDING SYSTEM

Charles M. Merkel, and Bert W. Barnette, both of Prattville, Ala., assignors to Continental/Moss-Gordin, Inc., Prattville, Ala.

Filed Sept. 10, 1971, Ser. No. 179,437
Int. Cl. B65g *53/04*, *53/34*
U.S. Cl. 302—28 **26 Claims**



A pneumatic card feeding system including a vertical feed chute for each card defining an air tight vertical bin laterally coextensive with the card width for receiving fibers and delivering a batt to the feed end of the associated card, and a pneumatic overhead conveyor duct having a transverse width much smaller than the lateral dimension of the chute for conveying fibers by vehicle air from a supply source across the tops of a series of the chutes along a fiber feed path extending cross-wise of the cards. Multiple extractor rollers at the top of each chute mechanically transfer fibers from the air stream into the chutes.

3,747,986

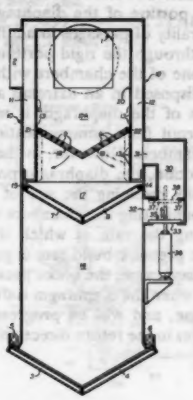
PNEUMATIC BULKY MATERIAL COLLECTOR SYSTEM

Bruce T. E. Boon, Wayne, N.J., assignor to Eastern Cyclone Industries, Inc., Fairfield, N.J.

Filed Oct. 5, 1971, Ser. No. 186,693
Int. Cl. B65g *53/40*
U.S. Cl. 302—62 **7 Claims**

Unique laundry and bulky material, collector assembly and method in which the bulky material being air conveyed, is removed from the system utilizing in combination a plurality

of inner arrangement of doors, intraactuated, so as to secure full closure of the sealing doors on every cycle and thus secure



a constant vacuum or pressure in the pneumatic conveying system.

3,747,987

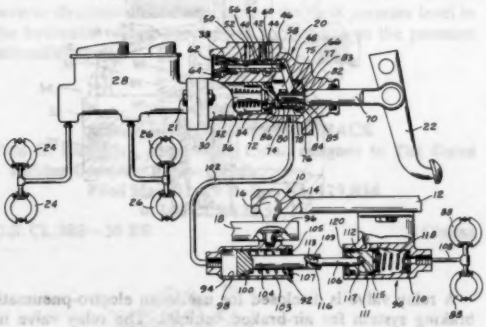
HYDRAULIC POWER BRAKE BOOSTER ACTUATED TRAILER BRAKE SYSTEM

Richard T. Hendrickson, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 10, 1972, Ser. No. 225,160

Int. Cl. B60t *13/00*

U.S. Cl. 303—7 **9 Claims**



A hydraulic brake system for a towing vehicle and a trailer. The towing vehicle brakes are operated by a hydraulic power boost device having a chamber connected to a pump via valve means, the latter of which controls the chamber pressure which acts on one end of a piston which is drivably connected to the vehicle master cylinder piston. A hydraulic slave actuator is connected in hydraulic communication with the chamber and includes a pressure responsive plunger drivably connected to the trailer master cylinder piston for operating the trailer brakes.

3,747,988

PROCESS FOR THE STABILIZATION OF ACRYLONITRILE BY DISTILLATION WITH A NITROXIDE

Hubert Charles Bailey, London, England, assignor to BP Chemicals Limited, London, England

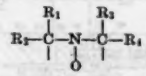
Filed Oct. 4, 1971, Ser. No. 186,469

Claims priority, application Great Britain, Oct. 5, 1970, 47,169/70

Int. Cl. C07c *121/32*

U.S. Cl. 203—8 **10 Claims**

A process for the recovery of acrylonitrile by distillation by adding to the distillation feedstock a nitroxide having the essential skeletal structure:



wherein R_1, R_2, R_3, and R_4 are alkyl groups and no hydrogen is bound to the remaining valancies on the carbon atoms bound to nitrogen.

A preferred nitroxide is 2,2,6,6 - tetramethyl piperid-4-one-1 -oxyl which may be used in the form of its clathrate compound with straight chain hydrocarbons.

3,747,989

ANTISKID DEVICE FOR A VEHICLE BRAKING SYSTEM

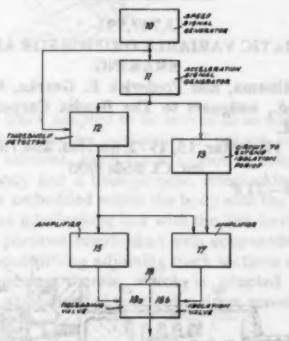
Paul Remillieux, Paris, France, assignor to Societe Anonyme D.B.A.

Filed May 21, 1971, Ser. No. 145,675

Claims priority, application France, June 1, 1970, 7019973

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 P **2 Claims**

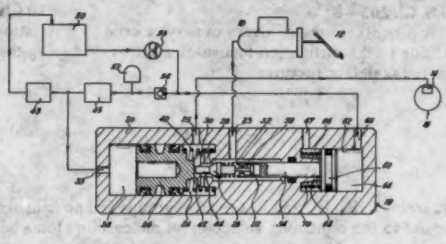


An electronic anti-skid device for a vehicle braking system, operative upon actuation of the brake pedal to periodically apply the brakes and isolate the braking system from the brake pedal under the control of signals representative of the wheel acceleration. During the periods when the braking system is isolated, the wheel acceleration curve comprises a negative portion followed by a positive portion having a peak value. With this device, the periods when the braking system is isolated are ending shortly after the wheel acceleration has reached its peak value. This is obtained by comparing the positive portion of the acceleration signal with the output signal of a time-constant circuit having a discharge curve which intersects the acceleration curve in the neighborhood of the peak value.

3,747,990
VEHICLE HYDRAULIC BRAKING SYSTEM

Christian Tanguy, Soisy Sous Montmorency, France, assignor to Societe Anonyme D.B.A.

Filed Dec. 3, 1971, Ser. No. 204,570
Claims priority, application France, Dec. 15, 1970, 7045119
Int. Cl. B60t 8/06
U.S. Cl. 303—21 AF 8 Claims

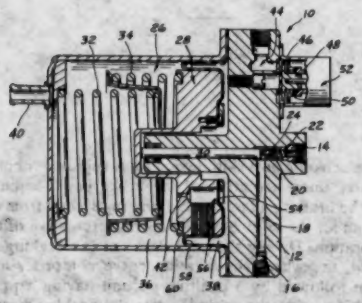


An anti-skid hydraulic braking system is disclosed which comprises a monitoring device responsive to the angular displacements of the wheels of the vehicle for controlling the fluid pressure level applied to a pressure modulator which in turn controls fluid communication between a standard automotive master-cylinder and the brake motors. The monitoring device is supplied with pressurized fluid from the pump of the general hydraulic system of the vehicle. Upon failure or malfunction of the pump, it is necessary to prevent the monitoring device from terminating fluid communication between the master cylinder and the brake motors which would prevent any further brake application. A control means is provided in the pressure modulator which comprises, in a chamber connected to the outlet of the pump, a reciprocable spring loaded piston which maintains the fluid communication between the master-cylinder and the brake motors when the pressure of said pump falls below a predetermined value.

3,747,991
PNEUMATIC VARIABLE ORIFICE FOR ADAPTIVE BRAKING

Irving R. Ritsema, and Frederick E. Goerke, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Mar. 15, 1972, Ser. No. 234,769
Int. Cl. B60t 8/06
U.S. Cl. 303—21 F 7 Claims

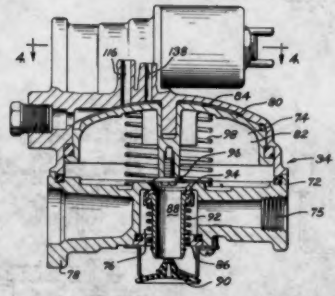


A vacuum-actuated adaptive braking modulator provides a non-linear brake pressure build curve without requiring a multiplicity of solenoid valves. The device includes the usual diaphragm slidably mounted within a housing and which defines a pair of compartments between opposite sides of the diaphragm and corresponding ends of the housing, and a slow pressure bleed orifice extending through the diaphragm that permits restricted fluid communication from one compartment to the other during a brake pressure build operation. The diaphragm includes a flexible resilient portion which interconnects the rigid portion of the diaphragm to the wall of the housing. A plurality of passages in addition to the slow bleed orifice extend through the rigid portion of the diaphragm to communicate one of the chambers with the other. When the diaphragm is disposed in an extreme actuated position, the flexible portion of the diaphragm is moved away from the passages to permit fluid communication through the latter between the chambers. However, as the diaphragm moves in the return direction, the diaphragm progressively closes the passages, thereby reducing the size of the total area of the passages communicating the chambers with one another, and thereby reducing the rate at which the diaphragm moves. Since the brake pressure build rate is governed by the rate of movement of diaphragm, the brake pressure build rate will be relatively large when the diaphragm is disposed in the extreme actuated position, and will be progressively reduced as the diaphragm moves in the return direction.

3,747,992
RELAY VALVE FOR ELECTRO-PNEUMATIC CONTROL SYSTEM

Dennis E. Schnipke, Elyria, Ohio, assignor to The Bendix Corporation, South Bend, Ind.

Filed Apr. 16, 1971, Ser. No. 134,660
Int. Cl. B60t 15/02
U.S. Cl. 303—40 3 Claims



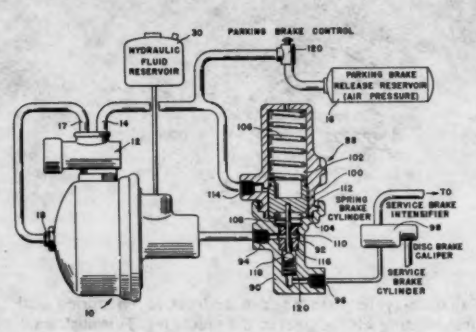
A relay valve is disclosed for use in an electro-pneumatic braking system for air-braked vehicles. The relay valve includes a conventional housing defining a chamber therewithin in which a control piston reciprocates. The piston divides the chamber into a primary section and a delivery section. Movement of the piston closes a valve which exhausts the delivery section and opens a valve which communicates air from a pressurized supply to the delivery section, and ultimately to the brake actuators. The piston is moved in the usual manner by admitting service air from the brake control valve of the system. However, in order to reduce the response time of the system, a first solenoid valve communicates supply air to the primary section when the brake valve is applied and a second solenoid valve exhausts the primary section to atmosphere when the brake control valve is released. Appropriate control circuitry is disclosed to operate the solenoid valves.

3,747,993

AIR/HYDRAULIC PARKING-EMERGENCY BRAKE SYSTEM

Roy E. Bartholomew, Elyria, Ohio, assignor to The Bendix Corporation, South Bend, Ind.

Filed Dec. 27, 1971, Ser. No. 211,862
Int. Cl. B60t *15/02*
U.S. Cl. 303—68 15 Claims



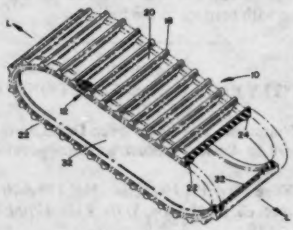
A braking system is disclosed which uses pressurized air to develop hydraulic pressure for maintaining the spring actuator in a spring-applied disc brake in the release position. The actuator includes a recycling valve which sequentially initiates and terminates air communication to an air-actuated hydraulic intensifier. The hydraulic outlet of the intensifier is connected to the inlet of a control valve, and the outlet of the control valve is connected to the hydraulic release mechanism of the spring brake. Another inlet port of the control valve is connected to an operator-operated parking brake control which communicates air pressure to the control valve when the vehicle operator releases the spring brake. When air pressure is communicated to the control valve, the latter shifts from a first position venting the hydraulic release mechanism of the spring brake to a fluid reservoir through the inlet port of the control valve, to a second position permitting generally uninhibited fluid communication from the inlet of the control valve to the outlet, but preventing fluid communication in the reverse direction, to thereby permit the fluid pressure level in the hydraulic release mechanism to increase as the pressure intensifier cycles.

3,747,994

EDGE RIB FOR ENDLESS TRACK

Paul E. Russ, Sr., Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Mar. 31, 1971, Ser. No. 129,834
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB 5 Claims



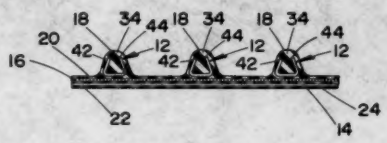
An edge rib for flexible and endless tracks of the polymeric type. The edge rib extends around each circumferential edge of the track and has a plurality of transverse grooves formed therein.

3,747,995

REINFORCEMENT FOR ENDLESS TRACK

Paul E. Russ, Sr., Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed July 12, 1971, Ser. No. 161,679
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB 4 Claims



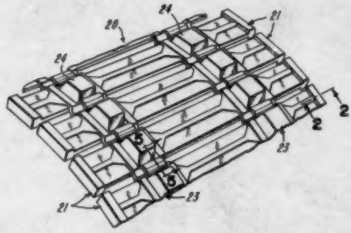
A transverse reinforcement for stiffening an endless track of the textile reinforced polymeric type, the transverse reinforcement having a generally horseshoe cross-section that interlocks the stiffener within the track.

3,747,996

TRACK SECTION AND ENDLESS TRACK USING SAME

Walter E. Huber, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 5, 1972, Ser. No. 215,495
Int. Cl. B62d *55/20*
U.S. Cl. 305—38 4 Claims



An endless track adapted to be moved in an endless path is provided and defined by a plurality of unique readily interlocked track sections. Each track section is comprised of a matrix-like body and a dual-purpose interlocking and reinforcing device embedded within the body with the device having at least one interlocking link with the link having exposed opposed end portions interlocked with cooperating end portions of links comprising adjoining track sections and the link having an opening therein which is adapted to receive therethrough an associated tooth of a drive sprocket used to drive the track.

3,747,997

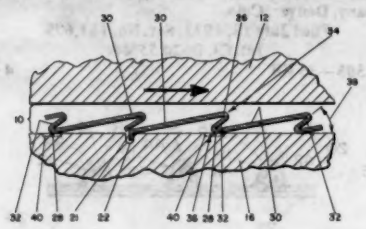
HYDRODYNAMIC FOIL BEARINGS

Leo W. Winn, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed July 22, 1971, Ser. No. 165,033
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 16 Claims

A hydrodynamic bearing system is provided wherein a resilient bearing insert structure is disposed within the spacing defined by the confronting surfaces of a first member (such as a housing with an opening) and a second member (such as a shaft received within the opening) which are movable (rotatable) relative to one another. The resilient bearing insert structure includes one or more bearing elements which are preformed (such as with corrugations of generally Z configuration) to provide one or more load supporting regions each of which includes two coacting operating portions one portion

coacting with the rotating shaft to create a load supporting hydrodynamic fluid film and the other portion underlying and



coacting with it to provide a tunable resilient supporting and damping means therefor.

3,747,998

HIGH SPEED MAGNETIC SHAFT BEARING

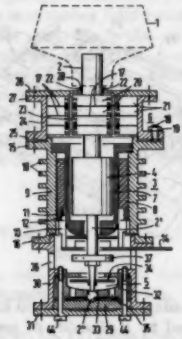
Gerald Klein, Ruckersdorf, and Gunther Vieweg, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 17, 1972, Ser. No. 227,571

Claims priority, application Germany, Feb. 23, 1971, P 21 08 590.5

Int. Cl. F16c *39/06*

U.S. Cl. 308—10 **11 Claims**



A bearing for substantially vertical shafts rotated at high speeds by electric motors or the like utilizes a spherical thrust bearing at the lower end of the shaft with an elastic radial bearing mounted on the upper portion of the shaft. The upper radial bearing comprises a magnetic radial bearing having a plurality of polarly magnetized annular or disc-like inner rings mounted adjacent to each other on the shaft and a plurality of polarly magnetized annular or disc-like outer rings separated from the inner rings by an air gap. The inner and outer rings are magnetically so disposed that they repel each other and thereby stabilize the shaft in the radial direction. An annular bearing member is also provided to cooperate with the magnetic radial bearing to prevent damage to the magnetic bearing because of excessive deflection of the shaft from its vertical position during the initial start up of the shaft.

3,747,999

ROTARY CUTTER FOR EARTH BORING BITS

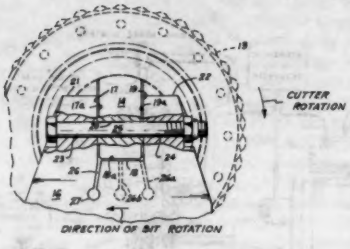
Dan B. Justman, Houston, Tex., assignor to G. W. Murphy Industries, Inc., Houston, Tex.

Filed Feb. 9, 1972, Ser. No. 224,825

Int. Cl. F16c *35/00*

U.S. Cl. 308—15 **9 Claims**

A drill bit including a rotary cutter mounted on a bearing shaft which is supported between two legs of a saddle or cutter yoke wherein a lug portion of at least one of the saddle legs is weakened as by slotting the leg. An end of the bearing shaft is secured to the saddle leg by a bolt which draws the weakened lug portion into tight engagement with the shaft end whereby



the shaft may be held against destructive chattering and against rotating with respect to the saddle leg. This abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,748,000

SPHERICAL BEARINGS

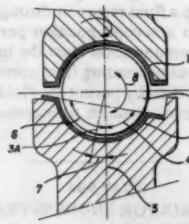
Nikolaus Laing, Hofener Weg 35-37, Aldingen bei Stuttgart, Germany

Filed Sept. 21, 1971, Ser. No. 182,503

Claims priority, application Austria, Sept. 25, 1970, 86660

Int. Cl. F16c *17/16*

U.S. Cl. 308—9 **9 Claims**



Spherical bearing construction having two cups engaging a ball wherein at least one of the cups has an effective frictional area which is asymmetrical with reference to the axis of rotation of the cup with respect to the ball.

3,748,001

RESILIENTLY BIASED CONSTANT CONTACT SIDE BEARING

Otto Walter Neumann, and Louis Dean Davis, both of Chicago, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

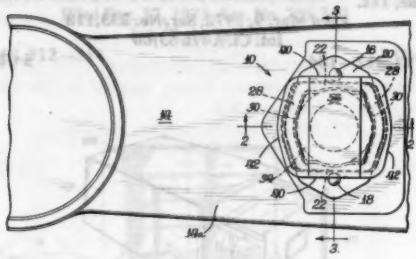
Filed Nov. 17, 1971, Ser. No. 199,620

Int. Cl. B61f *5/14*, *5/50*; F16c *17/04*

U.S. Cl. 308—138 **4 Claims**

A side bearing for a railroad car and truck acting between the car truck bolster and the car body bolster to resist nosing and swiveling of the truck and to control rocking of the car body. Each side bearing comprises a tubular base unit rigidly attached to the truck bolster, a vertical spring mounted inside

the base unit and engaging the lower interior portion of a cup-shaped cap, the upper surface of the cap being frictional engagement with a wear plate attached to the lower surface of the car body bolster.

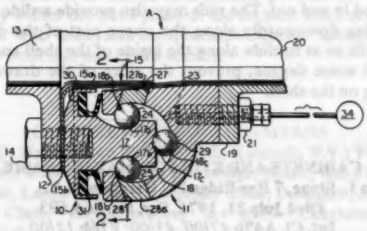


3,748,002

INTERLOCKING, RING TYPE BALL BEARING WITH SEALS

James E. Barker, Chula Vista, and Howard R. MacDonald, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed May 21, 1971, Ser. No. 145,740
Int. Cl. F16c *19/14, 33/00*
U.S. Cl. 308—174 **3 Claims**



A fail-safe ring type ball bearing capable of supporting a cantilever load comprises a first bearing race having an annular end flange extending therefrom, and a second bearing race having an annular, co-axial groove in an end thereof, the flange of the first bearing race being inserted co-axially into the groove of the second bearing race. Two rows of bearing balls ride in raceways provided one in each side of the annular flange, and one in each of the sides defining the groove. The two rows of balls support the races for relative rotation and in interlocking relation with each other. An additional row of bearing balls also may ride in raceways formed in the top of the flange and the bottom of the groove. An important use for the invention is to rotatively interconnect adjacent segments of a vectoring nozzle for an aircraft jet engine.

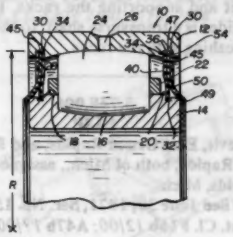
3,748,003

MULTIPLE ELEMENT BEARING SEAL

Richard H. Barber, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Nov. 1, 1971, Ser. No. 194,641
Int. Cl. F16c *33/76, 33/80*
U.S. Cl. 308—187.2 **6 Claims**

A bearing seal in which a first annular ring of resilient non-metallic material is positioned in oppositely disposed grooves in the inner and outer racerings of the bearing assembly. A second annular sealing ring of resilient non-metallic material has one edge positioned in one of the grooves with the first sealing ring. The outer edge extends axially outwardly of the bearing assembly and rests on the corner face of the other racering in a contact seal. The first ring is vented so that during the relubrication process lubricant bleeds past the ring and lifts the face of the second sealing ring off the corner face of the racering to permit the lubricant to escape outside the bearing assembly thereby relieving internal pressure from the lubricant holding space.

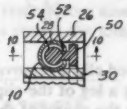


3,748,004

BALL BEARING WITH HOLLOW TRUNCATED SPHERICAL BALLS

Lewis W. McKee, Brookfield, Conn., assignor to The Barden Corporation, Danbury, Conn.

Filed May 11, 1971, Ser. No. 142,152
Int. Cl. F16c *33/30*
U.S. Cl. 308—212 **6 Claims**



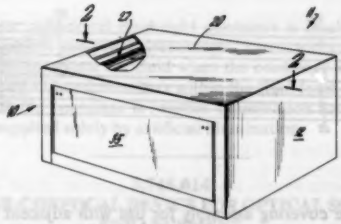
A ball bearing comprising inner and outer rings having raceways therein and having a plurality of hollow truncated spherical balls each having the configuration of a major segment of a sphere in the raceways together with means for maintaining the outer spherical surfaces of the balls in contact with the raceways and to prevent contact between the raceways and the edges of the truncated portions of the balls.

3,748,005

FILE CABINET WITH PIVOTED SLIDING FRONT DOOR

William Chovanec, Montvale, and Peter J. Heck, Teaneck, both of N.J., assignors to Art Steel Company, Inc., Bronx, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,251
Int. Cl. E06b
U.S. Cl. 312—109 **11 Claims**



The front end of this file cabinet is closed by a door which is hinged at its upper end to the cabinet. The door may be swung upwardly and forwardly about its pivot to horizontal position and then pushed back into the top of the cabinet to keep the cabinet open at the front. Door pivot blocks are fixed at the outer ends of the upper end of the door. At the inner sides of

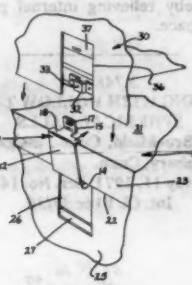
the upper ends of the side walls of the cabinet, are fixed horizontal racks with upwardly facing teeth. The door pivot blocks carry horizontally aligned pivot pins journalled on rack slides, slidably mounted on rack carriers fixed to the side walls of the cabinet and supporting the racks. Rotatably mounted on the rack slides is a transverse shaft, to the ends of which are fixed gears meshing with the racks.

3,748,006

CLIP

Edward C. Levit, East Grand Rapids, and Robert C. Van Gessel, Grand Rapids, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed June 30, 1971, Ser. No. 158,386
Int. Cl. F16b *12/00*; A47b *17/00, 19/00*
U.S. Cl. 312—111 **8 Claims**



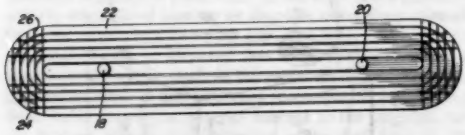
A generally J-shaped clip is removably mounted to a desk or table top by hooking a leg of the clip underneath the edge of the top and pressing the shank of the clip against the side of the top such that the clip is held in place by the spring force between the leg portion of the clip pressing against the bottom surface of the table top and an upper lip on the clip which presses downwardly against the tabel top. A tab of the clip is integrally formed therewith and extends upwardly from the lip to receive a service module or the like which can be securely mounted to the tab thereby fastening the module to the table or desk top.

3,748,007

SPACE COVERING ASSEMBLY

Lawrence H. Mathias, P.O. Box 172, Dover, Ohio

Filed Jan. 7, 1972, Ser. No. 216,095
Int. Cl. A47b *96/18*; A47f *9/00*
U.S. Cl. 312—140.4 **4 Claims**



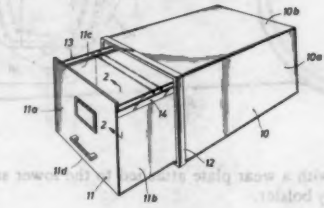
A space covering assembly for use with adjacent cabinets separated by an open space, said assembly comprising a one-piece flat molded plastic panel with a plurality of cuts or break lines on one side, a pair of fastening pegs integral with said panel and extending from the one side thereof, and a pair of mounting blocks having fastening apertures therein for retentively receiving the fastening pegs, said mounting blocks being of easily cutable material for sizing to snugly fit into the space separating the cabinets.

3,748,008

STORAGE CABINET

James T. Pryor, Dallas, Tex., assignor to Nuperm, Inc., Ducanville, Tex.

Filed Mar. 9, 1972, Ser. No. 233,118
Int. Cl. A47b *63/00*
U.S. Cl. 312—184 **5 Claims**



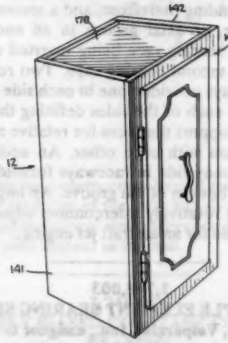
This invention relates to a filing cabinet and to a drawer therefor of the type which is made from paperboard as the principal construction material. The file drawer of the cabinet is provided with a pair of support rails respectively extending along the upper edges of the side walls of the file drawer. The rails can include an upwardly faced channel portion extending laterally into the box so that hanging folder type files can be placed in the drawer with the hangers of the files being protected from contact with the shell of the cabinet as the drawer is moved in and out. The rails may also provide a slide portion extending downwardly along the upper part of the drawer's side walls so as to slide along the inside of the shell and therefore, to some degree, prevent the sides of the drawer from rubbing on the shell.

3,748,009

CABINETS AND KITS FOR MAKING SAME

Norman L. Stone, 7 Rye Ridge Pl., Harrison, N.Y.

Filed July 21, 1971, Ser. No. 164,593
Int. Cl. A47b *47/00, 43/00*; F16b *12/00*
U.S. Cl. 312—263 **3 Claims**



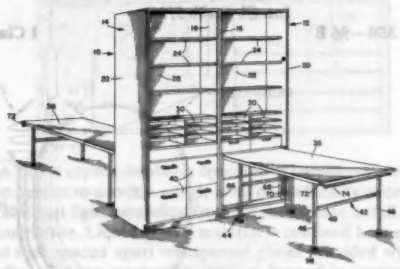
A cabinet and kit for making the cabinet are disclosed in which the walls are structurally interlocked so that the cabinet can be assembled easily and quickly without tools. One of the interlocks comprise a pair of orthogonal channels and mortices which mate with orthogonal tenons. Another interlock comprises a mortice and tenon wherein a strap spans part of the mortice and locks with a bracket mounted in a recess in the tenon.

3,748,010

WORK STATION WITH SELF-STORING DESK

Gilbert M. Garte, 62 Curtis St., Scituate, Mass.

Filed Dec. 17, 1971, Ser. No. 209,317
Int. Cl. A47b 77/10
U.S. Cl. 312—314 3 Claims



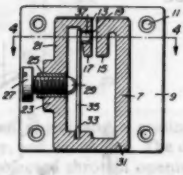
A work station with a self-storing desk which can be used to advantage in hospitals and the like to provide much needed space in times of emergency or peak loading. The work station includes at least one section which receives through a slidable mounting a desk which can be supported by legs in a horizontal use condition, or folded to a vertical position for storing generally within the front plane of the section. Each section is provided with shelf and compartment storage accessible at both the front and rear of the section.

3,748,011

CLOSURE CONTROLLING MEANS

Robert D. Hazzard, 66 Huntville Rd., Katonah, N.Y.; Peter H. Trotter, Walker Pond Rd., Sturbridge, Mass.; Kai Frederik Schlein, Langs Hagnet 12, Lyngby 2800, Denmark, and Angelo Clute, Skjoldgardsvej 2, 2929 Charlottenlund, Denmark

Filed May 18, 1971, Ser. No. 144,557
Int. Cl. A47b 88/04; E05b 65/44
U.S. Cl. 312—333 5 Claims



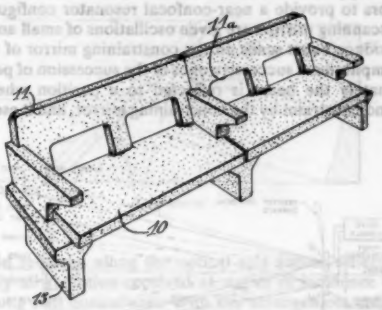
Means for varying the force required to open a closure member, drawer, or the like. A stationary compartment and a movable closure member for said compartment, a keeper member fixed in said stationary compartment, and a latch mechanism fixed on said movable closure member and in closure member closed position coactive with said keeper member. Means associated with said latch mechansim for varying the coactive tension between it and the keeper member to vary the force necessary to open the closure member, drawer or the like. A method of assembling the latch mechanism and the keeper member and for affixing the keeper member to the compartment in alignment with said latch mechanism for proper coaction therebetween when the closure member, drawer, or the like is in closed position.

3,748,012

BENCH STRUCTURE

Hershel Abelman, 1636 Columbia Ave., Chicago, Ill.

Filed Feb. 28, 1972, Ser. No. 229,796
Int. Cl. A47c 7/00, 1/16, 7/54
U.S. Cl. 297—440 6 Claims



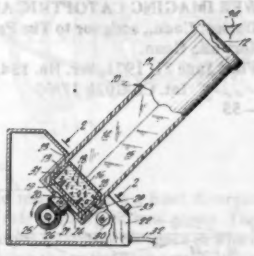
A joining pedestal for benches assembled in line and formed with seats and back rests. The pedestal has a lower post with a wide top to seat meeting end-portions of adjoining bench seats; and such portions have setbacks to receive the shank of an upper pedestal portion. The latter seats at the rear in setbacks of the back rests continued upwardly from those of the seats. The upper pedestal portion is tapered in forward direction to form an arm rest. Before assembling the pedestal and bench end-portions as stated, the joining areas are coated with an adhesive.

3,748,013

KALEIDOSCOPE

Alfred A. Orans, 225 Ellison Ave., Westbury, N.Y.

Filed Mar. 31, 1972, Ser. No. 239,872
Int. Cl. G02b 27/08
U.S. Cl. 350—5 6 Claims



A hollow cylindrical fluid-tight container is freely carried upon the object end of a kaleidoscope. Vanes within the container serve to agitate the fluid when the container is rotated. Free floating colored members within the fluid form changing patterns as the container is rotated. Illumination for the container is supplied solely by artificial illumination.

3,748,014

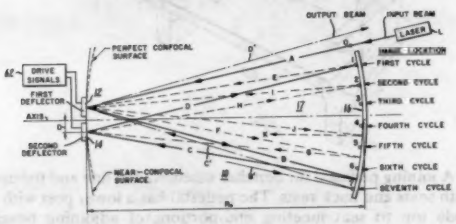
NEAR-CONFOCAL DEVICE FOR OPTICAL SCAN ENHANCEMENT

Leo Beiser, Flushing, N.Y., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,745
Int. Cl. G02b 17/00
U.S. Cl. 350—7 15 Claims

Two scanning mirrors are mounted in near-confocal relation to a constraining mirror with which they cooperate to define an optical cavity. An optical beam is introduced into

this near-resonator and experiences alternate reflection from one of the scanning mirrors on the one hand and the constraining mirror on the other. The reflection from the scanning mirrors occurs alternately from two fixed positions respectively centered on the two scanning mirrors, and the reflection from the constraining mirror occurs from a succession of nonrecurring positions (because of the adjustment of the scanning mirrors to provide a near-confocal resonator configuration). The scanning mirrors are given oscillations of small amplitude to produce beam scans on the constraining mirror of increasing amplitude at successive ones of the succession of positions. Ultimately the beam is reflected to a position where it is beyond constraint by the constraining mirror, and it escapes as



an output beam executing a large-amplitude scan.

The two basic embodiments may be described as spherical and planar. The latter comprises either a positive lens or a concave reflector to transfer the beam between the scanning mirrors and the constraining mirror.

Additional features include the adaptation of the device to other deflection means such as gradient or Bragg scanning, the retro-reflection of the output beam as an input beam for additional cycling within the same device, and operation of a plurality of devices as modules in a system, the principle of periodic aperture transfer being employed so that the output beam of one device can serve as the input beam of another device.

3,748,015

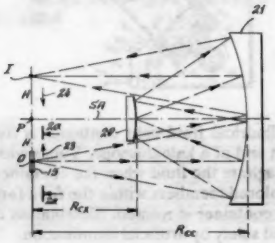
UNIT POWER IMAGING CATOPTRIC ANASTIGMAT

Abe Offner, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed June 21, 1971, Ser. No. 154,948

Int. Cl. G02b 17/00

U.S. Cl. 350—55 **10 Claims**



A catoptric system for forming in accurate micro detail an image of an object at unit magnification with high resolution is provided by convex and concave spherical mirrors arranged with their centers of curvature coinciding at a single point. The mirrors are arranged to produce at least three reflections within the system and they are used in the system with their axial conjugates at said point and to provide two off axis conjugate areas at unit magnification in a plane which contains the center of curvature, the axis of the system being an axis normal to the latter plane and through said point. This combination is free from spherical aberration, coma and distortion and, when the algebraic sum of the powers of the mirror reflecting surfaces utilized is zero, the image produced is free from third order astigmatism and field curvature.

3,748,016

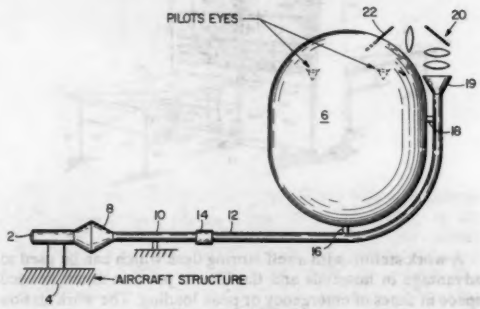
IMAGE TRANSMISSION AND PRESENTATION DEVICE

F. Henry Rossire, Salisbury, Conn., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 22, 1971, Ser. No. 210,845

Int. Cl. G02b 5/16

U.S. Cl. 350—96 B **1 Claim**



Means for employing fiber optics in conjunction with a user's head piece for transmitting visual information from a remote source and for superimposing said information in the user's field of vision without altering his range of vision.

3,748,017

ELECTRODES FOR LIQUID CRYSTAL DISPLAY DEVICE

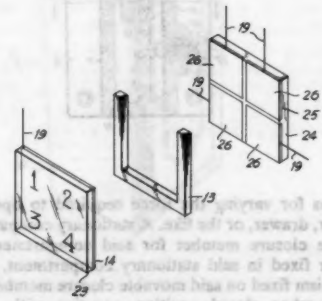
Katsumi Yamamura, 5531-28, Nakasu, Suwa-shi, Nagano-ken; Kouji Kakizawa, 780-3, Oaza-Shiga, Suwa-shi, Nagano-ken; Yoshio Yamazaki, 10616, Takagi, Shimosuwa, Suwa-gun, Nagano-ken; Kanemitsu Kubota, 855-4, Shiga, Suwa-shi, Nagano-ken, and Izuhiko Nishimura, 3-3-5, Owa, Suwa-shi, Nagano-ken, all of Japan

Filed May 26, 1971, Ser. No. 146,946

Claims priority, application Japan, June 5, 1970, 45/48051; June 10, 1970, 45/49489

Int. Cl. G02f 1/16

U.S. Cl. 350—160 LC **6 Claims**



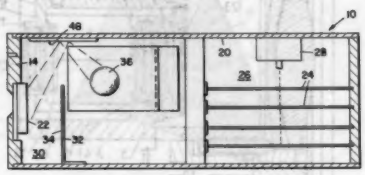
In a liquid crystal display device, gases, and in particular, H_2 and O_2 may be generated. Deleterious effects are avoided by incorporating in at least one of the electrodes a catalyst for the recombination of said gases.

3,748,018

UNIVERSAL TRANSMISSION REFLECTANCE MODE LIQUID CRYSTAL DISPLAY

Howard C. Borden, Jr., Atherton, Calif., assignor to American Micro-Systems, Inc., Santa Ana, Calif.

Filed Feb. 9, 1972, Ser. No. 224,684
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 6 Claims



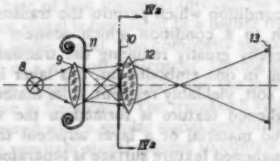
A liquid crystal display is operable in transmission or reflection modes to provide a high level of readability over a range of ambient light extending from total darkness to full sunlight illumination. Liquid crystal material is confined between front and rear spaced apart transparent plates provided with inner surfaces having conductive coatings formed in predetermined display patterns. The rear plate is coated with one or more layers of material that provide for the transmission of light through it and also for the reflection of ambient light directed through the front of the display. A back illumination light is provided behind the rear plate which is energized either manually or automatically when the ambient light level in front of the display falls below a predetermined level.

3,748,019

PHOTOGRAPHIC RECORDING AND REPRODUCING METHOD AND APPARATUS UTILIZING SPATIAL CARRIER FREQUENCIES

Friedrich Bestenreiner, and Reinhold Deml, both of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 803,676, March 3, 1969, abandoned
This application Apr. 12, 1971, Ser. No. 133,438
Claims priority, application Germany, Mar. 2, 1968, P 16 22 865.2; June 4, 1968, P 17 72 568.7
Int. Cl. G02b 27/38
U.S. Cl. 350—162 SF 5 Claims



The picture of an object and a grating are formed on a photosensitive layer, and developed. The developed picture is illuminated and projected through openings of a diaphragm which blocks a direct image. Due to the grating, diffraction orders for imaging the picture are produced so that the grating has the effect of a spatial carrier frequency.

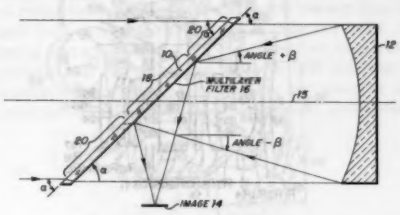
3,748,020

CATADIOPTRIC OPTICAL SYSTEM HAVING MULTILAYER FILTER REFLECTOR

Robert E. Fischer, Carlisle; Wayne Knapp, Sudbury, and George R. Wirtenson, Acton, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Mar. 31, 1972, Ser. No. 240,066
Int. Cl. G02b 17/00
U.S. Cl. 350—199 4 Claims

A catadioptric optical system for improving the quality of the image and the transmittance of the optical system. The invention is an improvement on the Cassegrain and Newtonian optical systems or any other optical systems wherein the secondary mirror partially obscures the primary mirror. The secondary mirror in these optical systems is provided with a multilayer, angle sensitive, filter coating, with the coating being designed to pass to the primary mirror substantially all radiation received along the optical axis and to reflect substantially all radiation received at angles of incidence other than along said optical axis. With this arrangement radiation normally blocked by the secondary mirror is passed to the primary mirror which results in an effective increase in the transmittance of the optical system and an improved modulation transfer function for the optical system.

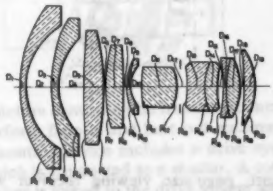


3,748,021

REVERSE TELEPHOTO LENS FOR NEAR-DISTANCE PHOTOGRAPHY

Akira Tajima, Kawasuki, and Kikuo Momiyama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1971, Ser. No. 130,900
Claims priority, application Japan, Apr. 11, 1970, 45/30505
Int. Cl. G02b 9/64
U.S. Cl. 350—214 8 Claims



In the disclosed telephoto lens a front divergent lens group passes light to a rear convergent lens group. The front divergent lens group forms a variable air space in which light from a point on an object on the optical axis travels almost parallel to the optical axis. The air space is varied so that when the lens is focused at a nearby object, the air space is reduced almost proportional to the advanced length of the whole lens. This avoids deterioration of close-up images.

3,748,022

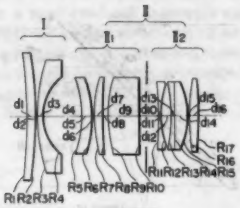
REVERSE TELEPHOTO TYPE LENS PREVENTED FROM THE DETERIORATION OF IMAGE AT THE TIME OF CLOSE SHOT

Akira Tajima, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1972, Ser. No. 231,657
Claims priority, application Japan, Mar. 11, 1971, 46/12786
Int. Cl. G02b 9/64
U.S. Cl. 350—214 11 Claims

A reverse telephoto type lens adapted for preventing the deterioration of image at the time of close shot, comprising a

front lens group having negative refractive power and a back lens group having positive refractive power, wherein the latter lens group is further divided into two positive lens groups,



which are spaced by a variable air interval, and whole lens system may be shifted approximately in proportion to the variation of said interval.

3,748,023

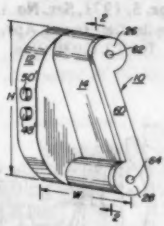
PORTABLE INFORMATION RETRIEVER

Gary K. Nelson, 1330 Finley Rd., Lombard, Ill.

Filed Apr. 10, 1972, Ser. No. 242,710

Int. Cl. G02b 27/02

U.S. Cl. 350—241 4 Claims



A low cost, page-size viewing receiver without optical power having relatively inverted opposite side viewing configurations which is capable of being held and operated by one hand, which provides for storage of a large amount of information on a scroll or tape therein, and which provides for quick retrievability of said information therefrom by searcher finger control of a reversible indexing motor drive of the scroll to bring the information into a viewing area from whence it can be easily read involving the use of the same fingers of the operator regardless of the side of the viewing device being observed.

3,748,024

MOUNTING FOR A ZOOM LENS

Christian Rodier, Creteil, and Paul Carre, Dijon, both of France, assignors to Societe de'Optique Precision, Electronique et Mecanique, Paris, France

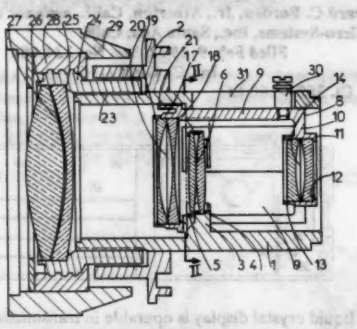
Filed Aug. 19, 1971, Ser. No. 172,971

Claims priority, application France, Sept. 7, 1970, 7032693

Int. Cl. G02b 7/02

U.S. Cl. 350—255 3 Claims

Mounting for a zoom lens having a fixed tube and an inner movable member, in which the fixed tube is provided with internal segments which hold a fixed lens, and the movable member is formed of longitudinal elements which extend



between one on each side of the segments and terminate in opposed annular portions which locate the movable lenses.

3,748,025

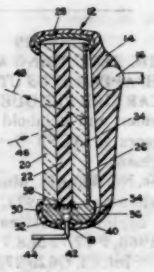
DAY-NIGHT MIRROR

James D. Van Putten, Jr., Holland, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Feb. 8, 1971, Ser. No. 113,397

Int. Cl. B60r 1/04

U.S. Cl. 350—280 8 Claims



This disclosure relates to a day-night or anti-glare mirror formed from a laminate wherein at least one layer is changeable from a condition which permits the transmission of light therethrough to a condition which scatters light incident thereon, thereby greatly reducing the transmission of light therethrough. In one embodiment, this layer is formed of a transparent, soft, yieldably resilient, solid material. A surface with a roughened texture is formed in the soft, yieldably resilient, solid material or a layer adjacent thereto so that when the roughened texture surface is separated from the adjacent surface, transmission of light is greatly reduced by the roughened surface by scattering, and when the roughened texture surface is pressed firmly against the layer adjacent thereto, light is easily transmitted through the composite laminate. Means are disclosed for separating and pressing together the rough textured surface and the surface adjacent thereto.

3,748,026

REFLECTOR FOR DISTANCE MEASUREMENT

Ragnar Scholdstrom, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Aug. 23, 1971, Ser. No. 174,082

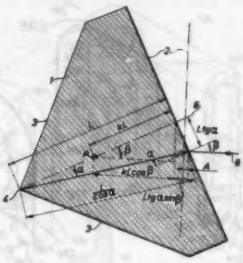
Claims priority, application Sweden, Aug. 31, 1970, 11814/70

Int. Cl. G02b 7/18

U.S. Cl. 350—287 1 Claim

A light reflector having a corner prism mounted for pivotal movement about at least one axis intersecting the optical axis

of the prism between the vertex and the base surface. The distance between the pivotal axis and the base surface is



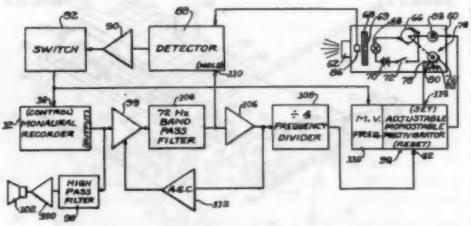
chosen in accordance with a special relationship for minimizing measurement errors due to misalignment of the prism with respect to incident light beams.

3,748,027

AUDIO-VISUAL METHOD AND APPARATUS

James E. Beck, Glenview, and Edward J. Ho, Buffalo Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 22, 1971, Ser. No. 191,668
Int. Cl. G03b *31/04*
U.S. Cl. 352—17 **7 Claims**



A motion picture camera generates a synchronization signal related to the rate of film transport through the camera. The synchronization signal is translated to a higher frequency and mixed with an audio signal. The composite signal is recorded upon the tape of a monaural recorder. During playback, the synchronization signal is separated from the audio signal and translated down in frequency. The translated synchronization signal is compared with a similar signal generated by the projector and the resultant signal utilized to control the speed of the projector.

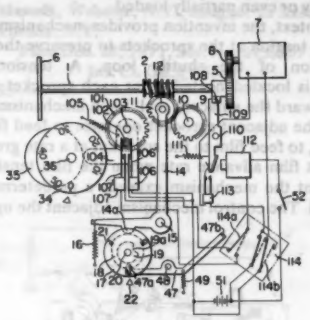
3,748,028

FILM REWIND DEVICE FOR COMPACT CINECAMERAS

Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 91,997, Nov. 23, 1970, Pat. No. 3,689,137. This application July 20, 1972, Ser. No. 273,626
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **3 Claims**

A film rewind device for compact cinecameras of the type using a film cartridge having no supply spool shaft operable from the exterior thereof but provided with detent means attached to a take-up core, and in which the length of film to be loosely supplied to the take-up chamber of the cartridge can be varied in proportion to the film roll diameter in the supply chamber of the cartridge by the utmost utilization of the fact that the space in each of the supply and take-up chambers varies in proportion to the length of film photographed, and the length of film to be loosely supplied into the take-up chamber



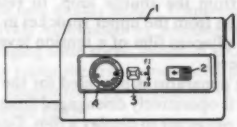
can be selected as desired within a predetermined range and that length of film can be rewound exactly.

3,748,029

FILM TRANSPORT CONTROL DEVICE FOR A MOTION PICTURE CAMERA

Kelichi Sakaguchi, Yokohama; Hiroshi Furukawa, Tokyo; Yoshio Komine, Tokyo, and Mamoru Shimazaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1971, Ser. No. 210,754
Claims priority, application Japan, Dec. 28, 1970, 45/128438; Dec. 28, 1970, 45/139438 (utility model)
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **17 Claims**



In a motion picture camera a film transport control device is arranged to perform fade-in and fade-out automatically. The film transport control device includes a drive system with a drive motor which is connected to a shutter. A rotatable programming member is linked to the drive system and rotates in one direction regardless of the direction of rotation of the drive system. Switches associated with the programming member are arranged so that during, at most, one rotating cycle of the programming member two change-overs take place, one from normal winding to rewind-back and a second from rewind-back to normal winding. A control member is arranged for activating the fade-in and fade-out operation. An operating knob in engagement with the programming member and the drive system is provided on the camera for achieving overlapping photography by establishing the desired rotational movement of the drive system.

3,748,030

FILM CONTROL IN MOTION PICTURE PROJECTORS

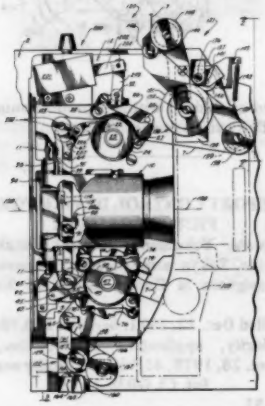
James B. Henderson, Duarte, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 22, 1971, Ser. No. 211,021
Int. Cl. G03b *21/44*
U.S. Cl. 352—124 **17 Claims**

A motion picture projector includes a film supply reel, an upper shuttle loop sprocket, a gate assembly which includes a frame-by-frame film advance mechanism, a lower shuttle loop sprocket, and a film takeup reel; these projector components

are disposed serially along a film path which traverses an optical axis within a shuttle loop defined between the sprockets. The reels are of very large capacity and have substantial inertia when fully or even partially loaded.

In this context, the invention provides mechanisms for controlling film tension at the sprockets to preserve the film and the definition of the shuttle loop. A tension control mechanism is located nextadjacent each sprocket along the film path toward the adjacent reel. Each mechanism is operative, when the adjacent sprocket operates to feed film to the shuttle loop, to feed film to the sprocket at a rate greater than the sprocket film advance rate when the film tension in the path adjacent the mechanism exceeds a predetermined film tension level. The control mechanism adjacent the upper shut-



tle loop sprocket also functions, when that sprocket operates to extract film from the shuttle loop, to retard the rate at which film is taken from the upper sprocket in response to the presence in the adjacent film of a tension level in excess of a predetermined level.

Film handling apparatus is provided for the film within the shuttle loop and is operatively disengaged from the film during operation of the projector to display a film. During rewind and stand-by modes of projector operation, the film handling apparatus is operatively engaged with the film to define a film path between the sprockets which is of definite length. This apparatus includes means for disabling the frame-by-frame film advance mechanism when the apparatus is disposed to define the length of film between the sprockets.

3,748,031

PROJECTOR AND CARTRIDGE FOR COMBINATION VISUAL AND SOUND APPARATUS

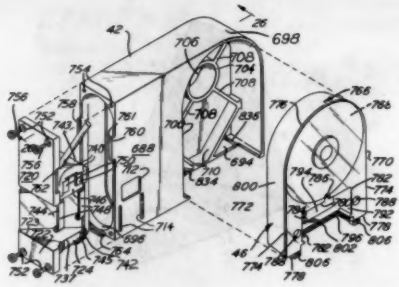
Donald A. Youngblood, Chalfont, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Division of Ser. No. 739,909, June 14, 1968, abandoned, which is a continuation of Ser. No. 535,149, March 17, 1966, abandoned. This application Apr. 6, 1970, Ser. No. 25,805

Int. Cl. G03b *31/06, 23/02*

U.S. Cl. 353—15 **11 Claims**

A projector for showing the frames of a filmstrip in noncontinuous sequence in synchronism with an audio presentation contains a receptacle which pivots out of the projector for receiving an audio/visual cartridge containing both an endless audio tape removable subcartridge and a removable endless-filmstrip holder. When the cartridge is inserted into the receptacle, the audio tape is moved to an operative position adjacent a tape head in the receptacle. When the receptacle with the cartridge is pivoted into the projector, the audio tape will be positioned adjacent a drive capstan in the projector and a pair of filmdrive sprocket wheels inthe projector will engage sprocket holes in the tape via respective slots in the cartridge. The filmholder contains a mirror and the cartridge contains a framing aperture such that the projection light beam can be



projected through the filmstrip, via the mirror and the framing aperture, when the filmholder is inserted in the cartridge.

3,748,032

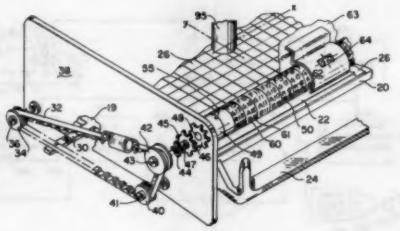
MICROFORM VIEWER INDEXING MEANS

Thomas A. Kyle, Bellbrook, and Walter L. Schutrum, Kettering, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Mar. 23, 1971, Ser. No. 127,145

Int. Cl. C03b *23/08*

U.S. Cl. 353—27 **1 Claim**



Means for indication of column and row positions of microform images in a viewer or reader to assure a rapid accessibility to microform data. In a microform system having a form carrier for placing the data images in position for projection, the carrier being linked to indexing means so that the image being viewed by the user can be identified as to its column and row designation. An indexing roller device containing the column and row designations is rotated by movement of the microform carrier in a fore or aft direction for indication of the row, and movement of the carrier in a left or right direction provides indication of the column in a conveniently placed window.

3,748,033

DEVICE FOR LOCATING A FILM TRANSPARENCY

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

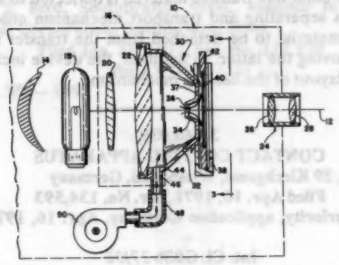
Filed Apr. 22, 1971, Ser. No. 136,453

Int. Cl. G03b *21/16, 1/52, 3/10*

U.S. Cl. 353—60 **9 Claims**

A device for locating a film transparency along the light path of a projector having an optical axis includes a bracket for holding a transparency in the projector for movement along the optical axis from a reference plane intersecting the light path. Means are provided for directing a current of air against the one surface of the transparency to form a first region on that surface wherein the pressure exerted on the transparency is greater than atmospheric pressure and a second re-

gion wherein the pressure exerted on the transparency is less than atmospheric pressure. The opposite surface of the transparency is exposed to atmospheric pressure. The transparency



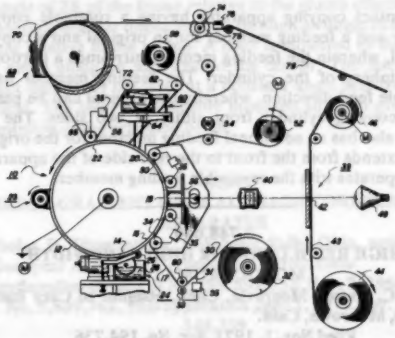
will be moved by the pressure imbalance until the total pressure exerted on the one surface is equal to the atmospheric pressure exerted against the opposite surface.

3,748,034

MANIFOLD IMAGING MACHINE

Ray H. Luebbe, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,340
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **12 Claims**



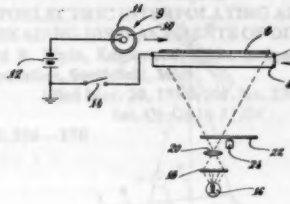
An apparatus is disclosed for use in the manifold imaging process wherein a rotatably mounted drum shaped electrode is contacted by an electrically photosensitive imaging layer residing on a substrate. The substrate is directed in a predetermined path bringing the electrode and the imaging layer into contact during the rotation of the drum. During rotation an electrical device places an electrical potential across the imaging layer while an optical arrangement permits exposure of the imaging layer to imagewise pattern of electromagnetic radiation to which the imaging layer is sensitive either before or while in contact with the rotatable electrode. Subsequent to exposure the substrate is separated from the rotatable electrode whereupon the imaging layer fractures in imagewise configuration conforming to the imagewise exposure of the imaging layer providing a positive image on one of the substrates and electrodes and a negative image on the other. The image residing on the rotatable electrode is removed and the electrode is rotated to receive additional imaging layer for the production of additional copies.

3,748,035

METHOD FOR SEQUENTIAL ILLUMINATION IN A POLYCHROME PROCESS

Kallis H. Mannik, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 28, 1971, Ser. No. 213,047
Int. Cl. G03g *15/00*
U.S. Cl. 355—4 **8 Claims**



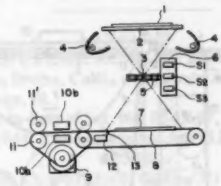
An illumination system is provided for a polychromatic imaging process of the type wherein a polychromatic original is illuminated by light from a continuous spectrum light source and the resultant light image is projected onto a narrow imaging zone which progressively traverses the length of an imaging layer which comprises at least two differently-colored, electrically photosensitive materials which are sensitive to light of predetermined, different wavelengths. A filter member having at least one group of at least two differently colored filters is rotated between a continuous spectrum light source and the imaging layer. The colored filters are selected to reduce or eliminate certain radiation bands which interfere with the production of the best quality image. Transverse speed pattern lines are effectively eliminated by rotating the disc at filter disc rotation/imaging zone speed values of above about 40 cycles/in. At lower ratios the transverse speed pattern lines can be effectively eliminated by bypassing a predetermined amount of unfiltered light.

3,748,036

EXPOSURE SET UP DEVICE IN A DUPLICATOR

Masaya Ogawa, Abeno-ku, Osaka-shi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 62,864, Aug. 11, 1970, abandoned.
This application Nov. 20, 1972, Ser. No. 307,830
Int. Cl. G03b *27/54, 27/72*
U.S. Cl. 355—69 **1 Claim**

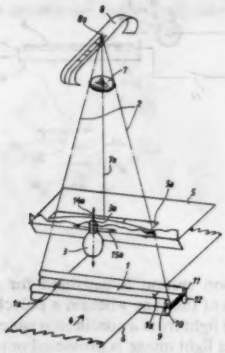


The present invention relates to a device for setting up the proper exposure holding the lightness of an object on a photosensitive paper in constant by changing the lightness of the illuminating light source in connection with the change of the duplication magnification, in a duplicator.

3,748,037
ARRANGEMENT FOR ILLUMINATING ORIGINALS IN MICROFILMING APPARATUS

Reinhard Kulterer; Adolf Moll, and Wilfried Hofmann, all of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 24, 1972, Ser. No. 247,143
Claims priority, application Germany, Apr. 27, 1971, P 21 20 727.2
Int. Cl. G03b 27/54; G02b 9/00
U.S. Cl. 355—71 7 Claims

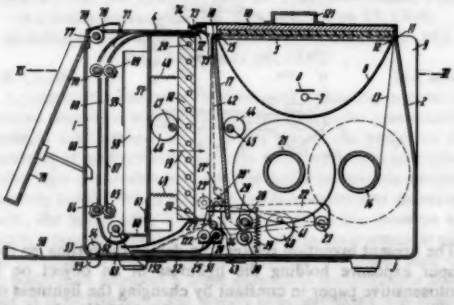


A microfilming apparatus wherein a single incandescent lamp illuminates successive increments of a continuously moving strip-shaped original in an image plane. The reflected light beam passes through a slit of a diaphragm and is focussed by a lens onto successive frames of a microfilm which moves continuously in the focal plane of the lens. The lamp is adjustable toward and away as well as transversely of the original in the image plane, and the width of the slit increases from its center toward both ends to compensate for the decreasing effective aperture of the lens in a direction from the optical axis toward its periphery as well as for decreasing intensity of light from the center toward the edges of the original. The lens is shielded from the lamp and is located between the two planes intermediate the microfilm and the lamp.

3,748,038
DEVICE FOR PRODUCING COPIES USING A TRANSFER MATERIAL

Walter Limberger, Hamburg-Poppenbuettel, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany

Filed Dec. 23, 1971, Ser. No. 211,603
Claims priority, application Germany, Dec. 23, 1970, P 20 63 480.4
Int. Cl. G03b 27/10
U.S. Cl. 355—100 12 Claims

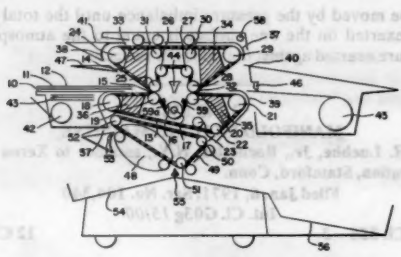


An improved device for producing copies, with an exposure plate and a vertically movable contact pressure cover associated therewith, processing an exposed transfer material and a receiving material, to which the picture is transferred by means of a transfer device, possibly including an exposure section of the device, and wherein the transfer material is stored on a reel in the form of a continuous band. In this improved device, the band-like transfer material is deflected to a storage reel, and a separating and transport mechanism enables the receiving material to be detached from the transfer material without moving the latter. In addition, the device includes an improved layout of the heating mechanism.

3,748,039
CONTACT COPYING APPARATUS

Udo Kuhn, 29 Kirchgasse, Wiesbaden, Germany

Filed Apr. 16, 1971, Ser. No. 134,593
Claims priority, application Germany, Apr. 16, 1970, P 20 18 224.5
Int. Cl. G03b 27/30
U.S. Cl. 355—106 10 Claims

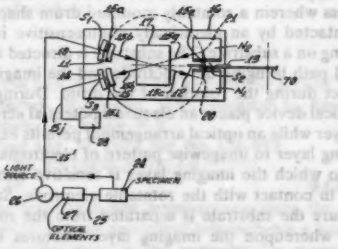


A contact copying apparatus having a rotatable copying cylinder and a feeding member for an original and a copying material, wherein the feeding member surrounds a portion of the periphery of the cylinder. The feeding member has a reversible feed direction, whereby the original can be passed to the copying cylinder from either of two sides. The apparatus also has an additional feeding member for the original which extends from the front to the rear side of the apparatus and cooperates with the reversible feeding member.

3,748,040
HIGH RESOLUTION OR HIGH BANDWIDTH MONOCHROMATOR

Roland C. Hawes, Monrovia, Calif., assignor to Cary Instruments, Monrovia, Calif.

Filed Nov. 1, 1971, Ser. No. 194,736
Int. Cl. G01j 3/04, 3/18
U.S. Cl. 356—101 10 Claims



A high resolution or high maximum bandwidth monochromator is provided with certain control means for controlling one jaw of an intermediate slit pair, and other control means for independently controlling the jaws in each pair of en-

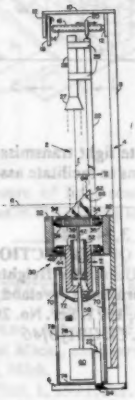
trance, exit and intermediate slits, the monochromator being useful for exploratory research work as well as routine analysis.

3,748,041

LASER BEAM ATTITUDE CONTROL DEVICE

Robert J. Bird, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 31, 1972, Ser. No. 222,239
Int. Cl. G01c 1/10
U.S. Cl. 356—149 4 Claims



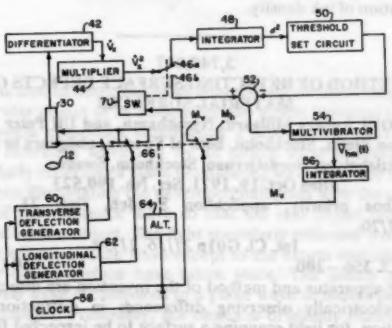
A mirror operatively connected between a frame and a plumb mechanism so that any angular displacement, through an angle of 2θ, of the frame relative to the plumb effects a corresponding angular displacement, through an angle of θ, of the mirror relative to the plumb. A laser is mounted to the frame and emits along an axis toward the mirror. The mirror will reflect light from the laser at a constant angle relative to the vertical. The laser is adjustably mounted so as to preset the orientation of the reflected beam.

3,748,042

DIRECT-GRADIENT OPTICAL IMAGE CORRELATION APPARATUS

Nicholas D. Diamantides, Cuyahoga Falls, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 592,532, Nov. 7, 1966, Pat. No. 3,609,762. This application June 1, 1971, Ser. No. 148,359
Int. Cl. G01b 11/00
U.S. Cl. 356—163 8 Claims



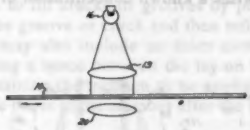
An electronic system for achieving correlation and matching information between two similar optical displays without mechanically or electronically nutating or moving one display relative to the other. The system developes from each display a series of voltage signals which are highly informative of the display elements. The voltage signals from one display are summed according to a schedule established by the other display to obtain a differential signal which is scaled to determine the direction and amount of position or offset error between the two displays. One display may be a live image of a target area while the second display is a reference image of the same area.

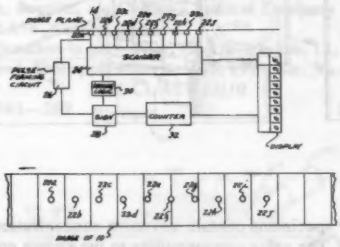
3,748,043

PHOTOELECTRIC INTERPOLATING ARRANGEMENT FOR READING DISPLACEMENTS OF DIVIDED SCALES

Richard B. Zipin, Englewood, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 20, 1972, Ser. No. 236,005
Int. Cl. G01b 11/04
U.S. Cl. 356—170 3 Claims





An arrangement is disclosed for providing interpolation between readouts of displacements of a divided scale with respect to a reference location in a reading system which includes photosensing and counting of magnified images of scale graduations relatively moving with respect to the reference location. This arrangement accomplishes interpolation between counts of successive graduations by means for projecting an image of a series of scale graduations onto a series of photosensors which have a vernier spacing relationship with the series image so that the particular photosensor in the series registering with a graduation image provides an indication of the fractional displacements of the scale relative to the reference location.

3,748,044

DIGITAL CHEMICAL ANALYSIS APPARATUS

Max D. Liston, Irvine, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

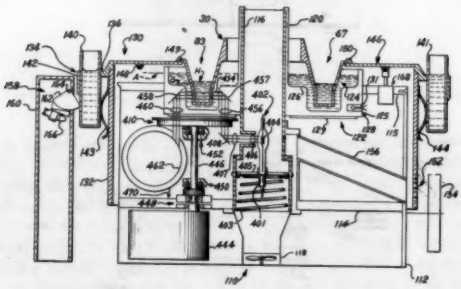
Continuation-in-part of Ser. No. 854,647, Sept. 2, 1969, Pat. No. 3,664,744. This application Apr. 12, 1971, Ser. No. 133,081
Int. Cl. G01j 3/46; G01n 33/16, 1/10
U.S. Cl. 356—180 15 Claims

The disclosure describes an improved system for evaluating rates of reactions and end point determinations that take place within a plurality of individaul secimens. The system includes a cuvette for holding each of the specimens in an individual compartment. Analyzing apparatus is used to generate and sequentially transmit a beam of radiant energy through each of the specimens. The analysis apparatus also produces an

analysis signal having a value proportional to a property of a particular specimen each time the beam passes through that specimen. Cycling apparatus causes the beam to sequentially and separately pass through each of the specimens during multiple cycles of operation. During the first cycle of operation, a first set of analysis signals having a first set of values corresponding to the specimens is created. Likewise, during a second cycle of operation, a second set of analysis signals having a second set of values corresponding to the specimens is created.

In order to determine the rate at which the reactions take place within each of the specimens, a memory is used to store at least the first set of values. Then, during the second cycle of operation, a processing circuit compares the values of the first and second sets of values which correspond to the same specimen. In this way, the rate of reaction of each specimen is automatically determined. By a similar technique, values can be created and compared in seconds in order to determine rates of reactions that proceed rapidly.

In order to analyze end joint determinations, one of the specimens comprises a known concentration of a substance,



and other specimens contain unknown concentrations of the substance. The value corresponding to the known concentration is stored in the memory, and other values correspndingly to the unknown concentration are compared with the value stored in the memory.

Improved components of the system such as a cuvette, a specimen dispenser, and an analyzing apparatus are also disclosed in the specification.

The analyzing apparatus preferably comprises apparatus for instantaneously determining the concentration of a predetermined substance that absorbs radiant energy within a predetermined band of wavelengths in the presence of other interfering substances that also absorb radiant energy in the region of the predetermined band. The determination is made by generating multiple wavelengths of radiant energy. The radiant energy is then sequentially transmitted in a single path through the substances, and the transmission is periodically interrupted by means which prevent the transmission of any radiation. The intensities of the radiant energy transmitted through the substances at the various wavelengths are then compared by electronic apparatus.

3,748,045

COLOR COMPARATOR

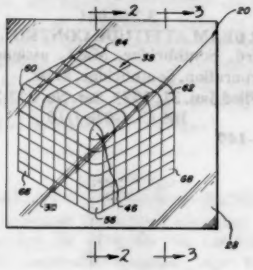
Robert W. Mitchell, 707 Myrtle Ave., St. Joseph, Mich.

Filed Apr. 19, 1971, Ser. No. 134,964

Int. Cl. G01j 3/52

U.S. Cl. 356—191 **20 Claims**

A color comparator providing, in a single device, an expedient and accurate combination of filter media arranged in a generally planar relationship to provide a three dimensional effect portraying the interrelationship of the filter media. The comparator includes neutral density material for providing



substantially uniform white light transmission over the entire comparator area and means to facilitate assembly.

3,748,046

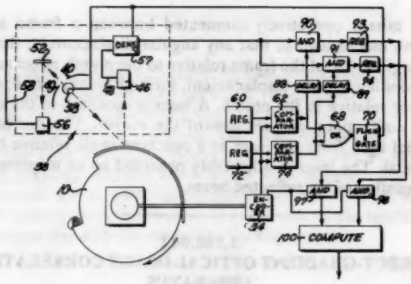
MEASUREMENT OF REFLECTION DENSITY

James Emmett Murray, University Heights, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 13, 1971, Ser. No. 207,503

Int. Cl. G01j 3/46

U.S. Cl. 356—195 **3 Claims**



A density measuring system in which light is reflected from part of an image area to measure ink density of ink applied. This light is compared with a reference test patch and the ratio of the light reflected by the test patch is multiplied by another ratio which is the ratio of the light reflected from the test light patch to light reflected from the surface of paper to obtain the indication of ink density.

3,748,047

METHOD OF DETECTING SURFACE DEFECTS OF MATERIAL SURFACES

Lars Olof Anders Millgard, Nynashamn, and Ulf Peter Trygveson Sjolin, Stockholm, both of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden

Filed Oct. 19, 1971, Ser. No. 190,523

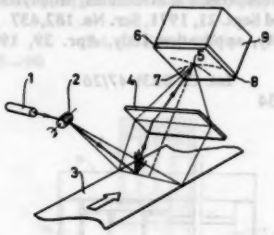
Claims priority, application Sweden, Oct. 21, 1970, 14177/70

Int. Cl. G01n 21/16, 21/32

U.S. Cl. 356—200 **10 Claims**

The apparatus and method of the invention are directed to photoelectrically observing differences in diffraction and reflection, for light scanning a surface to be inspected for defects, the comparison being between a pattern for the unknown surface and a pattern for a tolerably acceptable smooth surface. In application to inspection of a surface of continually

moving sheet material, a flying-spot scanner is caused to scan generally transverse to sheet motion, and the photoelectric



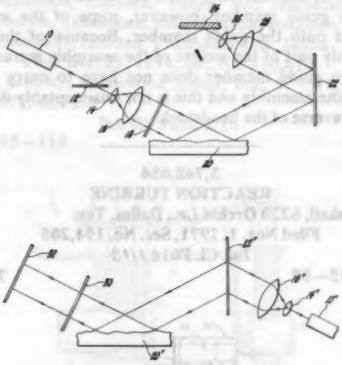
response is a measure of light scattered by transiently observed abnormalities in the moving surface.

3,748,048

METHOD OF DETECTING CHANGES OF A SPECULAR SURFACE

Juris Upatnieks, Ann Arbor, and Philip V. Mohan, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1971, Ser. No. 194,734
Int. Cl. G01n *21/48*
U.S. Cl. 356—212 **4 Claims**



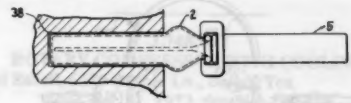
A method of detecting small dimensional surface changes in a specular object or of comparing two nearly identical specular objects comprises illuminating a holographic plate by a plane reference wave and by an object wave produced by specularly reflecting a plane illuminating wave from the object and then illuminating the developed halogram with the conjugate of the reference wave so that the real object image is formed on the object. The light specularly reflected from the object will be a plane wave except to the extent that changes in the object surface have taken place. The nearly planar reflected wave is compared to a plane wave to detect the surface changes. Preferably, the object is originally illuminated by a patterned plane wave so that the final wave reflected from the object during reconstruction can be compared to a negative transparency of the pattern whereby surface changes are readily apparent.

3,748,049

LIQUID APPLICATOR DEVICE

Siegfried Knupfer, Bernhauser Strasse 21, 7303 Neuhausen, and Hermann Brinkmann, Gottl.-Daimler-Strasse 50, Neuhausen, both of Germany

Filed Apr. 16, 1971, Ser. No. 134,767
Int. Cl. B05c *7/06*
U.S. Cl. 401—9 **14 Claims**



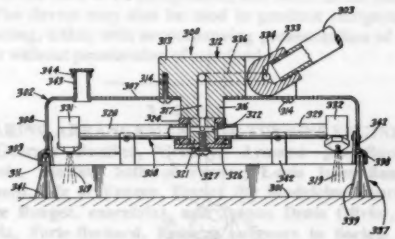
A device for the application of liquids, particularly high viscosity substances, such as glue and the like, comprises a lay-on member which is inflatable and which is connected to a filling and discharge line for causing the inflation. The device may be used to fill cracks or grooves by placing the lay-on member in the groove or crack and then inflating it. The lay-on member may also include an inner core within the envelope defining a space between the lay-on member and the core for containing the medium to be applied and which will issue from the pores of the member after the lay-on member is inflated.

3,748,050

CLEANER ASSEMBLY

Harold A. Poppitz, c/o Chaska Chemical Company Inc., 304 Master Ave., Savage, Minn.

Continuation-in-part of Ser. No. 10,707, Feb. 12, 1970, abandoned. This application Nov. 12, 1971, Ser. No. 198,144
Int. Cl. A47l *13/10*
U.S. Cl. 401—289 **50 Claims**



A cleaning apparatus having a pan-shaped housing enclosing a rotatable spinner assembly equipped with a plurality of rotatable laterally directed arms for carrying cleaning fluid under pressure to nozzles. Cleaning fluid under pressure is discharged in a circular pattern out the open side of the housing close to the surface to be cleaned. Brushes connected to the housing scrub the surface as the apparatus is moved over the surface. A pair of facing housings are adjustably mounted on a frame used to change the elevation of the housings. One of the frames is adjustably mounted on a support so that the space between the housings can be changed. A plurality of caster wheels and a handle may be connected to a housing so that the apparatus is movably supported above a surface.

3,748,051

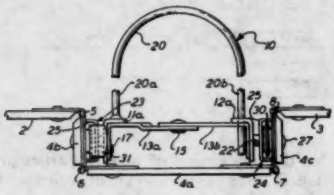
LOOSE-LEAF BINDER MECHANISM

John L. Frank, Wyandotte, Mich., assignor to Litton Business Systems, Inc., Orange, N.J.

Filed Aug. 27, 1968, Ser. No. 755,584
Int. Cl. B42f *3/00*
U.S. Cl. 402—75 **7 Claims**

A loose-leaf binder having a central sheet holding unit detachably coupled along both its outer sides to the binder

cover. For sheet loading and unloading, the sheet holding unit is uncoupled from the binder cover on one or the other of its sides and the unit opened. Alternatively, the entire closed sheet holding unit is uncoupled from the cover on both its sides and completely removed from the binder for loading and



unloading. The prongs of the sheet holding unit have substantially straight side leg portions extending substantially normal to the spine of the cover and in the same general direction as the closed covers. Hence, the capacity of the binder can readily be increased without increasing the size of the cover, by using a sheet holding unit having prongs with longer legs.

3,748,052

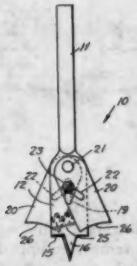
ADJUSTABLE HIGH SPEED BIT

Iwer F. Jensen, Port Clinton, Ohio, assignor to Brit-Jen Tool Co., Inc., Lakeside, Ohio

Filed July 23, 1971, Ser. No. 165,450

Int. Cl. B23b *51/00*

U.S. Cl. 408—188 **4 Claims**



An adjustable high speed wood bit adapted for use with an electric drill and having a long cylindrical shank with a flat blade integrally formed on the lower end thereof. The flat blade has a point on its lower end for centering the drill and forming a pilot hole. The lower edges of the flat plate alongside of the point are oppositely sharpened to cut the wood in forming a bore. A pair of blades are pivotally secured to opposite sides of the flat plate with each blade having a slot partially overlying a vertical slot in the blade. A bolt extends through the three slots and may be raised and lowered in the vertical slot of the flat plate to cause the blades to swing outwardly increasing the diameter of the bit. The lower edges of the blades are sharpened to cut the wood in forming a bore. The bolt securely fastens the blades in adjusted position during the cutting operation. A scale is formed on the flat plate to cooperate with the side edge of one of the blades to indicate the size of the bore which will be drilled by the bit in a specific adjusted arrangement.

3,748,053

SUSPENSION DEVICE FOR THE HEADSTOCK OF A MACHINE TOOL

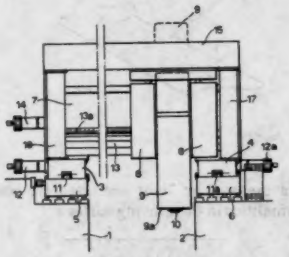
Maso Galbarini, Pavia, and Francesco Cotta Ramusino, Milan, both of Italy, assignors to Innocenti Societa Generale Per L'Industria Metallurgica & Meccanica, Milan, Italy

Filed Sept. 21, 1971, Ser. No. 182,437

Claims priority, application Italy, Apr. 29, 1971, 68419 A/71

Int. Cl. B23b *47/26*

U.S. Cl. 408—234 **6 Claims**



A large machine tool of the portal type is disclosed in which a headstock is carried by a headstock bearing carriage which slides along a horizontal guide member. The problem of errors due to deflections of the guide member under the weight of the headstock bearing carriage and headstock assembly are alleviated by mounting the headstock bearing carriage on two support beams over the guide member and suspending the headstock bearing carriage from the beams by means of two very strong springs. Thus the support beams normally support the weight of the assembly and the guide member supports no weight, merely serving as a guide; as the beams deflect under the weight of the assembly when the headstock is traversed across the guide member, however, some of the weight is transferred onto the guide member. Because of the strong springs, only part of the weight of the assembly is transferred so that the guide member does not have to carry the full weight of the assembly and this is not unacceptably deflected during a traverse of the headstock.

3,748,054

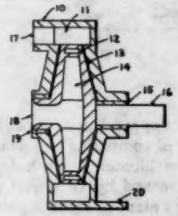
REACTION TURBINE

Michael Eskeli, 6220 Orchid Ln., Dallas, Tex.

Filed Nov. 1, 1971, Ser. No. 194,205

Int. Cl. F01d *1/18*

U.S. Cl. 415—80 **7 Claims**



A method and apparatus for generating power in response of a fluid flowing from a higher pressure to a lower pressure through a reaction turbine. Said fluid enters said turbine rotor wheel near the center, is then pressurized within said rotor wheel and then discharged via exit nozzles mounted on said wheel in a backward direction; said fluid discharge generating a torque on said wheel, said torque then being passed to the rotor shaft as the useful work output of said turbine. Fluids used may either gaseous, liquids or mixtures of the two.

3,748,055

ROTOR AND STATOR WHEEL CONSTRUCTION FOR A TURBO MOLECULAR PUMP

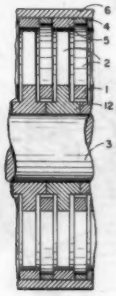
Willi Becker, Weilburgerstr. 40, 6333 Braunfels, Germany

Filed July 12, 1971, Ser. No. 161,662

Claims priority, application Germany, July 15, 1970, P 20 35 063.4

Int. Cl. F01d *1/26*

U.S. Cl. 415—90 **11 Claims**



A turbo molecular pump is provided with rotor and stator wheels containing thin-walled blades each having the same thickness, with the blades extending radially outwardly from a carrier body which can be either ring or disc shaped. Each blade is shaped so that the acute angle formed between the tangential plane at any given point on its surface spaced from the axis of the wheel and the plane of the wheel decreases as the distance of the point increases from the axis of the wheel.

3,748,056

TURBINE BLADE COOLING

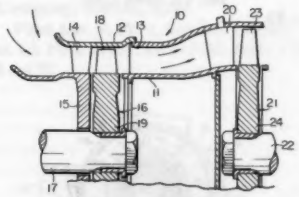
Kelichi Nakanishi, Ohta-ku, Tokyo, and Noritoshi Handa, Kanazawa-ku, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 22, 1971, Ser. No. 210,810

Claims priority, application Japan, Feb. 9, 1971, 46/5160; Feb. 18, 1971, 46/9154

Int. Cl. F01d *5/14*

U.S. Cl. 415—115 **1 Claim**



A cooling system for the turbine wheel and blade assembly of a gas turbine engine, which system comprising a cooling air flow passage provided on the turbine wheel and blade assembly at one of the external surfaces thereof. The cooling air flow passage is comprised of a cooling air inlet formed in a stationary part of the gas turbine engine, an intermediate passage defined between the side wall of the turbine wheel and the adjacent side wall of the stationary part or stator body of the gas turbine engine, and an ejector portion defined between the circumferential edge of the turbine wheel and the adjacent edge of the stationary part of the gas turbine engine which ejector portion opens to a high temperature gas flow passage in which the turbine blades are operatively disposed at the base portion of the turbine blade. The turbine wheel and blade assembly is also provided with an additional cooling air flow passage at another one of the external surfaces thereof. The additional cooling air flow passage is comprised of a cooling air inlet formed in a rotational shaft driven by the turbine wheel, an intermediate passage defined between another side wall of the turbine wheel and adjacent side wall of another stationary part of the gas turbine engine, and an ejector portion defined between another circumferential edge of the turbine wheel and the adjacent edge of another stationary part of the gas turbine engine which ejector portion opens to the high-temperature gas flow passage at the opposing side of the base portion of the turbine blades.

3,748,057

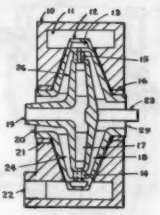
ROTARY COMPRESSOR WITH COOLING

Michael Eskeli, 6220 Orchid Ln., Dallas, Tex.

Filed Jan. 11, 1972, Ser. No. 216,929

Int. Cl. F04d *31/00*

U.S. Cl. 415—116 **4 Claims**



A method and apparatus for compressing fluids by employing a rotating rotor wherein said fluid compressed to a pressure that is higher than the unit exit pressure; said fluid is discharged from said rotor via exit nozzles discharging backward; said fluid being cooled within said rotor by employing a second fluid that may be either compressible or non-compressible type. Specific fluids to be used that are disclosed are air as the fluid to be compressed, and water as the second fluid. The device may also be used to produce refrigeration and heating, either with accompanying pressurization of said fluid, or without pressurizing of said fluid.

3,748,058

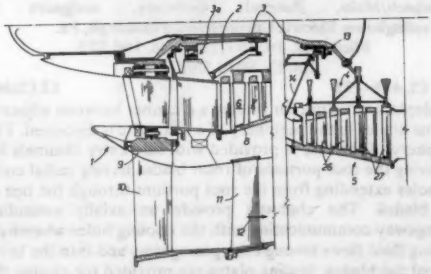
BEARING ARRANGEMENT FOR TURBINE ENGINE

Jean Georges Bouiller, Brunoy; Armand Jean-Baptiste Lacroix, Itteville, both of France; Louis Jules Bauger, deceased, late of Vanues, France (by Madeleine Henriette Aimee Bauger, executrix), and Jeanne Denis Ollvier, executrix, Ferte-Bernard, France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Mar. 1, 1972, Ser. No. 230,638

Int. Cl. F01d *21/00, 21/02*

U.S. Cl. 415—123 **2 Claims**



A shaft of a turbo jet carrying the rotor of a turbine and receiving apparatus which applies to the shaft an axial thrust which is greater than that of the turbine and directed in the

opposite direction, and supported in bearings of which one, acting as the thrust bearing, is located adjacent to the turbine and is mounted in a support which is translatorily movable and is held in abutment in the direction of the thrust of the receiving apparatus in such a way that in the case of a fracture of the shaft, the bearing is displaced by the thrust of the turbine until the rotor blades engage frictionally the stator vanes, thereby braking the turbine and preventing the risk of a disintegration of the turbine.

3,748,059

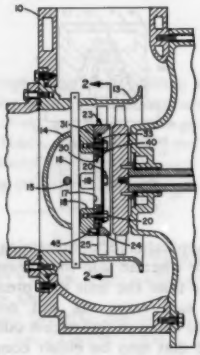
INLET STRUCTURE FOR TURBOMACHINE

Arthur J. Miller, Irwin, and Robert A. Miller, Jeannette, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed June 6, 1972, Ser. No. 260,091

Int. Cl. F01d 9/02

U.S. Cl. 415—136 **5 Claims**



The nozzle ring is positioned on the inner end surface of the nose piece. A clamping member is formed with inner and outer spaced apart flanges. The inner flange is positioned on the surface of the nose piece and the flanges extend from a connecting portion toward the nozzle ring. The outer flange of the clamp member extends over a portion of the nozzle ring. A fastening member, such as a capscrew, extends through the clamp flanges and when tightened, serves to clamp the inner clamp flange tightly against the nose piece and surface and simultaneously the outer clamp flange yieldingly clamps the nozzle ring against the nose piece surface. The invention includes a discoidal heat shield. The peripheral marginal portion of the shield overlies the clamp member. The heat shield may be formed with tabs interlocking with the fastening screws to prevent the same from loosening.

3,748,060

SIDEPLATE FOR TURBINE BLADE

Birger O. Hugoson, Wallingford, Pa., and Norbert Vettel, Offenbach/Main, Buergel, Germany, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

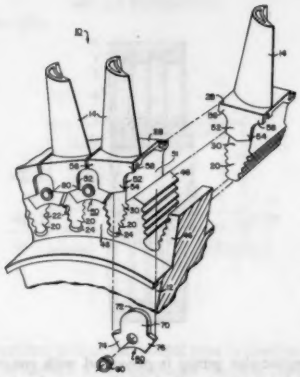
Filed Sept. 14, 1971, Ser. No. 180,375

Int. Cl. F01d 5/08, 5/18

U.S. Cl. 416—92 **12 Claims**

Sideplate structure for sealing a chamber between adjacent turbine blades in the periphery of a rotor disc is disclosed. The periphery of the disc is provided with side entry channels for receiving the root portions of rotor blades having radial cooling holes extending from the root portions through the tips of the blades. The channels provide an axially extending passageway communicating with the cooling holes whereby a cooling fluid flows through the passageway and into the holes to cool the blades. Sealing plates are provided for closing the downstream end of the passageways.

A sideplate is provided for each pair of adjacent blades and is disposed on one side of the pair of blades to seal the downstream end of the space between the adjacent blades. The sideplate has a generally T-shaped configuration with an upper main body portion and lower arms extending from the main body. Means are provided on the blade extensions of the rotor blades defining a groove, one side of which on one rotor blade being complementary in shape to the other side thereof on another rotor blade positioned adjacent said one rotor



blade. With two blades positioned adjacent each other a generally U-shaped groove having generally circumferentially extending lower sections is defined between the blades. The U-shaped groove is shaped and sized to snugly and slidably receive the sideplate. Locking means are provided for securing the sideplate against unlimited radial downward movement with respect to adjacent rotor blades.

3,748,061

PROPELLER CONSTRUCTION

Donald A. Henrich, Lake Villa, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 57,283, July 22, 1970, abandoned. This application Dec. 13, 1971, Ser. No. 207,490

Int. Cl. B63h 1/20

U.S. Cl. 416—93 **11 Claims**

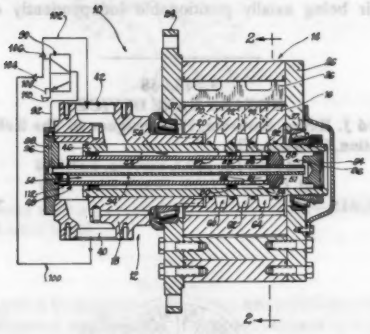
Disclosed herein is a propeller including a bushing part adapted to be mounted on a propeller shaft for common rotary movement of the bushing part with the propeller shaft, a resilient member bonded to the outer periphery of the bushing and having an outer non-circular configuration including a series of alternate areas of greater and lesser radial distance from the axis of said bushing and a propeller blade part having a hub including a bore with an inner configuration including a series of alternate areas of greater and lesser radial distance from the axis of the propeller and detachably receiving said resilient member.

3,748,062

SELF ENERGIZING VALVE MEANS FOR FLUID TRANSLATING DEVICE

John P. Wilcox, Columbus, Ohio, assignor to J. I. Case Company, Racine, Wis.

Filed July 21, 1971, Ser. No. 164,597
Int. Cl. F01c 1/00; F03c 3/00; F04c 1/00
U.S. Cl. 418—177 15 Claims



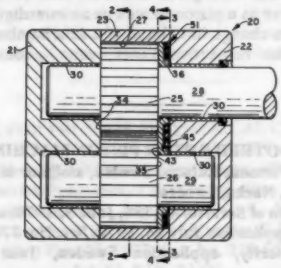
A self energizing valve for use in controlling the flow of fluid to a fluid translating device having inner and outer members cooperating to define an annular space and being relatively rotatable by flowing fluid through a plurality of passageways communicating with the annular space. The self energizing valve slides in a valve bore and is automatically maintained in a first position by the pressure of fluid flowing through a fluid passage in the valve communicating with the passageways. The valve and bore cooperate to define a cavity and the fluid passage is connectable to the cavity and the pressure of the fluid in the cavity will move the valve from the first position.

3,748,063

PRESSURE LOADED GEAR PUMP

Richard C. Putnam, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Apr. 9, 1971, Ser. No. 132,682
Int. Cl. F01c 19/08; F03c 3/00; F04c 27/00
U.S. Cl. 418—132 12 Claims



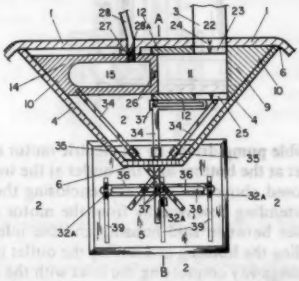
An improved pressure loaded pump having a flat sealing plate in the gear cavity with a face spaced from a parallel end face of the housing. A land member extends axially between the plate and housing in this area to surround the inlet and shaft openings on the plate and to define a pressure loading chamber. A seal pack in the chamber seals against the land member and one of the parallel seal plate and housing faces to separate the chamber from the inlet and shaft openings. The seal pack, in itself, further defines zones of pressure on the seal plate maintained at pressures different from that in the chamber.

3,748,064

PUMP WITH BASICALLY REDUCED PUMPER FORCE

Steven I. Molnar, 143-17-38th Ave., Apt. 1C, Flushing, N.Y.

Filed Mar. 12, 1971, Ser. No. 123,665
Int. Cl. F04b 17/00, 35/00
U.S. Cl. 417—400 3 Claims



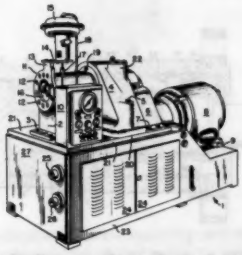
In the interior of a pressurized container or an extension thereof a casing and a congruent plunger are opposingly positioned between two angularly disposed metal plates; a small motor drives the mechanism by interconnection of and a two-armed lever and push rods.

3,748,065

GAS COMPRESSOR CONSTRUCTION

Karol Pilarczyk, 6 Pepper Lane, Loudonville, N.Y.

Division of Ser. No. 44,034, June 8, 1970, Pat. No. 3,644,054.
This application Nov. 29, 1971, Ser. No. 202,977
Int. Cl. F04b 17/00
U.S. Cl. 417—423 1 Claim

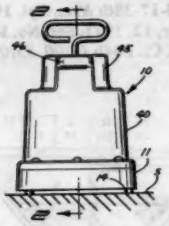


A gas compression machine having a base, a rotor assembly, casing means for the rotor assembly mounted on the base, inlet fluid housing means separate from said casing means, a telescopic connection between the housing means and casing, a resilient seal interposed at the location of the telescopic connection, drive means also connected to the casing, the base being subdivided into a gas intercooler section and a lubricant accommodating section.

3,748,066
SUBMERSIBLE PUMP

Frank H. Sully, and Loren J. Simer, both of Minneapolis, Minn., assignors to Paddle Pumps Incorporated, Minneapolis, Minn.

Filed Dec. 13, 1971, Ser. No. 207,432
Int. Cl. F04b 17/00
U.S. Cl. 417—424 4 Claims



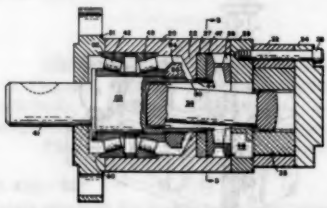
A submersible pump driven by an electric motor and having the liquid inlet at the bottom and the outlet at the top, a sealed housing disposed above the inlet and enclosing the motor, a drive shaft extending downwardly from the motor and carrying an impeller between said housing and the inlet, a water jacket encircling the housing and having the outlet in its upper end and a passageway connecting the inlet with the lower portion of the jacket and said passageway and outlet located on diametrically opposite sides of the shaft axis so that water passing from the inlet to the outlet will move upwardly and around the housing through the jacket.

The invention is further characterized by extending the drive shaft upwardly from the motor into a bushing formed in the housing to securely position the motor within the housing and by providing a spacer means between the motor and impeller for proper positioning of a seal around the drive shaft.

3,748,067
FLUID PRESSURE DEVICE INCLUDING AXIALLY POSITIONABLE SHAFT MEANS AND ROTARY VALVE MEANS

George V. Woodling, 22077 W. Lake Rd., Rocky River, Ohio

Continuation of Ser. No. 880,677, Nov. 28, 1969, Pat. No. 3,592,233.
Filed July 19, 1971, Ser. No. 163,706
Int. Cl. F01c 1/02; F03c 3/00; F04c 1/02
U.S. Cl. 418—61 6 Claims

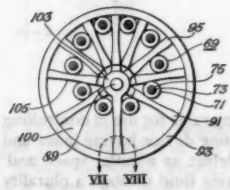


Fluid pressure device including axially positionable shaft means and rotary valve means. Said shaft means and said rotary valve means are independently and axially positionable in housing means having first and second end portions. Closure means is removably secured to said first end portion of said housing means. Stationary valve means is removably secured to said second end portion of said housing means. Said shaft means rotates said rotary valve means relative to said stationary valve means. Rotatable and orbitable fluid pressure means is secured to said stationary valve means. Said stationary valve means and said rotary valve means control the flow of fluid to and from said rotatable and orbitable fluid pressure means. Positionable means including said closure means fixes the axial position of said shaft means in said housing means. Said rotary valve means has an axial position fixed by said stationary valve means against which it is rotated, whereby said rotary valve means and said shaft means are axially fixed independently of each other. Said rotary valve means and said shaft means have mechanical connection means therebetween which includes non-rotative connection means to rotate said rotary valve means by said shaft and axially slidable connection means to accommodate for axial dimensional tolerances between said shaft means and said rotary valve means incident to their being axially positionable independently of each other.

3,748,068
ROTARY VANE DEVICE

Leonard J. Keller, Sarasota, Fla., assignor to The Keller Corporation, Sarasota, Fla.

Filed Feb. 18, 1972, Ser. No. 227,384
Int. Cl. F01c 1/00, 19/00; F04c 1/00
U.S. Cl. 418—137 2 Claims



An eccentric rotor vane device that may be employed as pumps, including compressors; or engines, including motors, characterized by an improved seal structure; in addition to conventional main chamber; first and second ports communicating with the main chamber; a plurality of angularly related radial vanes, independently pivotal and rotatable about a vane axis within the main chamber; a rotor that is eccentrically mounted with respect to the main chamber; and a power delivery shaft connected with the rotor. The improved seal means, in a specific embodiment, comprises cylindrical vanes guides of the rotor engaging concave faces of adjacent vanes on either side such that the vane guide is maintained in substantially uniform engagement with the vane lateral faces as it traverses radially inwardly and outwardly therealong during rotation of the rotor such that a satisfactory seal is maintained intermediate the vane guide and the vanes so that the vane guide can serve as a piston as well as an interdigitating means for effecting a change in volume of a subchamber defined intermediate the respective vanes, vane guides, and main chamber.

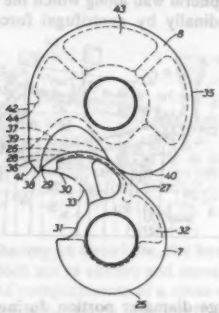
3,748,069
TOOTHED ROTOR PISTON MACHINE

Jan Edvard Persson, Ektorp, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 44,738, June 9, 1970, abandoned.
This application July 14, 1972, Ser. No. 271,981
Claims priority, application Sweden, June 18, 1969, 8636/69
Int. Cl. F01c 1/08; F04c 1/14, 17/04
U.S. Cl. 418—191 4 Claims

Rotary piston machines have a casing with two intersecting cylindrical bores in which a main rotor and a gate rotor are mounted for rotation. Each rotor has a hub and one tooth with a concave flank extending from the hub and a recess adjacent said flank. The rotors define with the bore walls a working chamber for an elastic fluid quantity which changes volume

during rotation. The torque produced by fluid pressure on a rotor tooth is directed in the same direction during a complete



rotation and working cycle of the machine due to the shape of the main rotor tooth.

3,748,070

APPARATUS FOR PREPARING PELLETS FROM A MELT

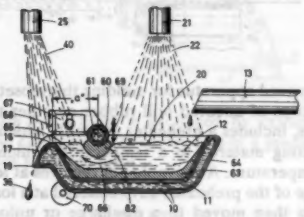
Joseph Heimerl, Altenhasslau, Germany, assignor to Leybold-Heraeus Verwaltung GmbH, Koln-Bayental, Germany

Division of Ser. No. 124,330, March 15, 1971. This application July 12, 1971, Ser. No. 161,847

Claims priority, application Germany, Feb. 26, 1971, P 20 12 213.8

Int. Cl. B29c *23/00*

U.S. Cl. 425—6 **5 Claims**



Auxiliary improved apparatus operable under a vacuum or under a blanket of an inert gas, wherein a melt container is provided accommodating a molten liquid metal under the influence of at least one generator for electrically charged particles, having means dividing the melt into two areas so as to prevent imbalance in the melt, and moving means for collecting the resultant refined metal droplets from the container.

3,748,071

DEVICE FOR PRODUCING SPHERICAL CHARGES FROM METALS AND ALLOYS

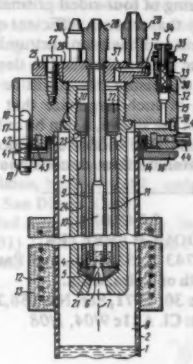
Alexandr Efimovich Likhtman, Kirpichnaya ulitsa 49 kv. 22; Vavil Ivanovich Pyatyshev, 7 Parkovaya ulitsa 3/3 kv. 3, and Valentin Romanovich Zagorodnikov, 1 Kozhukhovsky proezd, 19, korpus 3, kv. 64, all of Moscow, U.S.S.R.

Filed Feb. 23, 1972, Ser. No. 228,667

Int. Cl. B29c *23/00*

U.S. Cl. 425—6 **3 Claims**

A device is disclosed for producing spherical charges from metals and alloys in which the working vessel containing the melt of the metal or alloy having a melting point of up to 900°C, is filled with inert medium disposed above the melt, and having a diaphragm with a hole through which a stream of the melt is injected into the receptacle filled with a heat-resistant liquid. The working vessel is secured to the receptacle in such a manner that in the latter an auxiliary receiving chamber is formed between the butt end of the working vessel and the surface of the heat-resistant liquid of the receptacle, which auxiliary receiving chamber is filled with an inert medium, in which the stream of the melt is split to form spherical



charges and allows the stream of the melt to be heated up to 1,100°C.

The device envisages mixing of the melt prior to injection, which provides for a uniform distribution of the components in the produced spherical charges.

3,748,072

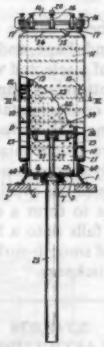
APPARATUS FOR COMPACTING CURD IN THE PROCESS OF MANUFACTURING CHEESE

Edmund Kerran Whelan, Hawera, New Zealand, assignor to The National Dairy Association of New Zealand Limited, Wellington, New Zealand

Filed Jan. 6, 1972, Ser. No. 215,778

Int. Cl. B30b *9/26*

U.S. Cl. 425—85 **6 Claims**



Apparatus is disclosed for compacting curd in the process of manufacturing cheese, the object being to provide apparatus whereby a mass of curd can be vacuum pressed into a single block of such large dimensions as to enable it to be cut into a plurality of separate pieces of a size comparable with or corresponding to that of standard unwrapped cheeses or consumer portions or wrapped as a complete block or part thereof, the apparatus thus having the important advantage of avoiding the time-consuming procedure hitherto adopted of vacuum pressing relatively small quantities of curd in separate hoops to form individual cheeses. The apparatus comprises a perforated metal sleeve adapted to receive a mass of curd. A metal casing surrounds the sleeve in such manner that a

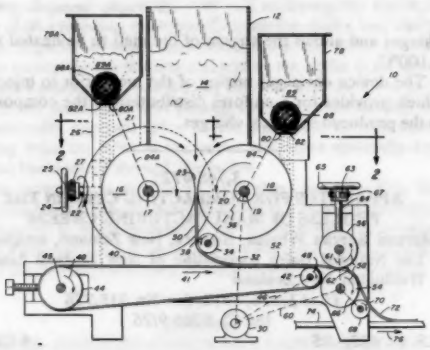
jacketed space is formed between the two. A lid or cover plate closes one end of the casing. The lid or cover plate is held removably in closed position. A piston slidably engages in the sleeve and is moved toward and away from the lid or cover plate when applied. The jacketed space between the sleeve and casing can be placed in communication with a source of vacuum, the sleeve being of four-sided prismatic shape and of such internal capacity that when a sufficient quantity of curd has been placed therein and has been vacuumized through the jacketed space and the perforations in the sleeve and has also been compressed by the piston, there will be formed a compacted block of curd of such large size that when freed, or while being freed, from the sleeve, it can be cut into a plurality of pieces of a size comparable with or corresponding to that of unwrapped cheese of standard size or consumer portions.

3,748,073

DOUGH SHEETER

Floyd L. Lankford, 2743 E. 53rd St., and Paul W. Marshall, 3507 E. 21st St., both of Tulsa, Okla.

Filed June 30, 1971, Ser. No. 158,281
Int. Cl. A21c *9/04, 1/08*
U.S. Cl. 425—92 **7 Claims**



This invention describes a device for accepting chunks of dough of irregular size and shape, and rolling out a continuous strip or sheet of dough of a selected width and thickness. The dough is placed in a bottomless hopper, from which it falls onto the surface of two counter-rotating drums, with parallel axes, in a horizontal plane. The surfaces of the drums are serrated, and the drums are synchronized to move downwardly together in the adjustably spaced gap between the drums. The serrations carry portions of the overlying dough mass toward the central gap, such as to form a continuous strip moving downwardly. This strip falls onto a horizontally moving belt that carries it to a pair of smooth-surfaced rollers that roll the strip to a final selected thickness.

3,748,074

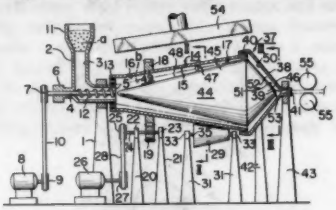
APPARATUS FOR PLASTICIZING THERMOPLASTIC SYNTHETIC RESIN

Haruo Nitta; Natoshi Sagawa; Hideo Enjoji; Kakuo Niwa, and Shinji Kume, all of Toho-cho, Yokkaichi-shi, Mie-ken, Japan

Filed Oct. 13, 1970, Ser. No. 80,427
Claims priority, application Japan, Oct. 17, 1969, 44/82766; Nov. 18, 1969, 44/91788; Feb. 23, 1970, 45/14983; Feb. 24, 1970, 45/15209
Int. Cl. B29b *1/04*
U.S. Cl. 425—207 **5 Claims**

Apparatus for plasticizing continuously resin material or wastes of used synthetic resin formed articles as much as possible. The apparatus does not consume so large energy for its extremely large plasticizing capacity, and moreover, it will not cause a cutting of resin molecules nor deterioration of the resin during the plasticizing operation contrary to the case as in the conventional screw extruder.

The apparatus comprises a rotating member having a frusto-conical inner peripheral wall along which the resin material is propelled longitudinally by centrifugal force from a small



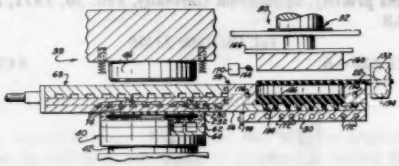
diameter to a large diameter portion during the plasticizing process. A cone shaped inner member mounted to rotate with said rotating member may be provided to form a flow passage between said inner peripheral wall and the outer surface of said cone member.

3,748,075

MOLDING APPARATUS

Don A. Taylor, 216 Mill St., Wadsworth, Ohio

Filed July 29, 1971, Ser. No. 167,240
Int. Cl. B29c *1/00*
U.S. Cl. 425—251 **38 Claims**



An improved apparatus for molding thermosetting material, such as strips of uncured mill rubber or other thermosetting elastomers, includes a preheater assembly which preheats the thermosetting material to a temperature which is below its curing temperature. A movable pot receives at least a portion of a charge of the preheated strip material at a loading station. The pot is then moved to a discharge or unloading station where a ram assembly is extended to force the thermosetting material from the pot into a mold. The ram assembly is then retracted and the pot is returned to the loading station. The pot is then filled so as to contain a charge which includes both preheated strip material and thermosetting material which was not forced into the mold on the previous cycle of operation. The pot is cooled at the loading station to maintain thermosetting material in the pot at a temperature below its curing or setting temperature. As the pot is being loaded, a slide block applies pressure against the mold and heats the thermosetting material in the mold to a temperature above its setting temperature.

3,748,076

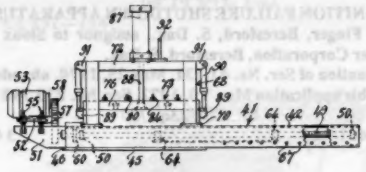
APPARATUS FOR CUTTING COMPACTED CURD INTO PIECES

Edmund Kerran Whelan, Hawera, New Zealand, assignor to The National Dairy Association of New Zealand Limited, Wellington

Filed Jan. 6, 1972, Ser. No. 215,779
Int. Cl. B26d *1/06*; B29c *17/14*; A01j *25/00*
U.S. Cl. 425—311 **9 Claims**

Apparatus for cutting into pieces a block of curd that has been compacted in a perforated sleeve arranged in a vertically disposed casing, comprises a horizontal main frame adapted to be secured to the upper part of the casing, a horizontal knife blade supported for longitudinal reciprocating movement in the main frame, a secondary frame so positioned on the main

frame that it will lie directly over the casing when the main frame has been secured to the latter, and a cutter bore mounted for upward and downward movement in the secon-



dary frame and having an open base, the box containing vertical partitions which act as cutters and serve to divide the box into a plurality of compartments of a cross-sectional size corresponding to that of the pieces to be cut from the block.

3,748,077

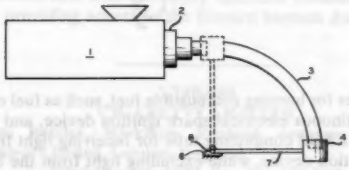
APPARATUS FOR PRODUCING PIPE HAVING A BEND

George E. Williams, and Olaf E. Larsen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 497,365, Oct. 18, 1965, Pat. No. 3,497,588. This application May 19, 1969, Ser. No. 825,537

Int. Cl. B29f 3/00; B39g 2/00

U.S. Cl. 425—317 **5 Claims**



An extrudate for a bend is produced by extruding thermoplastics and constraining the extrudate in a predetermined path to produce a desired bend.

3,748,078

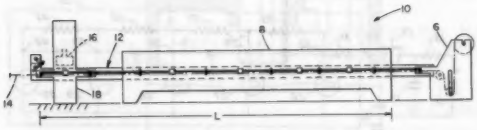
FORMING MACHINE WITH WEB TRANSPORT

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Mar. 16, 1972, Ser. No. 235,304

Int. Cl. B29c 3/04, 17/00

U.S. Cl. 425—383 **14 Claims**



In a web forming machine (e.g., with pre-heat oven and die for plastic sheet) the web gripping and transporting members extending along the web (e.g., on a long chain) are advanced by a hydraulic actuated rotor stroking back and forth through a fraction of a revolution, with controlled deceleration of the system by combination of an orifice progressively occluded by the rotor at stroke end and a linkage establishing the motion of the gripping members as dependent upon motion of the rotor in varying ratio, with greatest value near mid-stroke and lesser values near end. The linkage shown is an elongated crank driving a rack which rides about and drives a pinion; preferably the crank extends parallel to the rack at the end of forward stroke and the pivot connecting rack to crank is adjustable to vary gripping member stroke. A clutch permits movement of the gripping members in only one direction and a controller engages the clutch during forward and disengages during backward stroke. The actuator, linkage and extended gripping members are movable as a unit to accommodate different web widths. The actuator is formed of a sandwich of plates, a central plate defining the chamber in which the rotor turns, as well as the stops, and an outer plate defines a fluid orifice which is occluded by the rotor for deceleration.

3,748,079

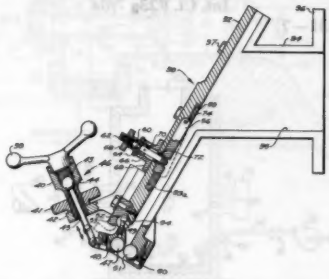
DOUGH SHEET SPREADER

Isabel L. Moreno, Walnut, and Edward F. Ruiz, 959 Cavina Blvd., San Dimas, both of Calif., assignors to said Ruiz, by said Moreno, San Dimas, Calif.

Filed Aug. 25, 1970, Ser. No. 66,734

Int. Cl. A01j 21/00, 25/12; B28b 21/52; B29h 3/00

U.S. Cl. 425—466 **5 Claims**



A dough sheet spreader through which dough is extruded in sheets of predetermined width and thickness. A multi-part housing having a downwardly distending, outwardly flaring passageway terminating in an egress, the lips of which are lined with dough release members, is adapted to receive and extrude dough-like material. Provision may be made for degassing the dough during the extrusion process. In one embodiment the thickness of the dough sheet can be varied and in another, both the width and thickness can be varied in progressive, finite steps.

3,748,080

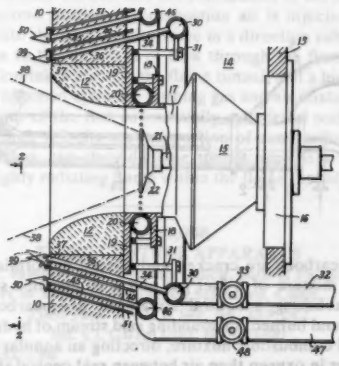
COMBUSTION CONTROL APPARATUS USING A LIQUID SPRAY

John Dunn, Mountvale, N.J., assignor to Peabody Engineering Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,024

Int. Cl. F23l 7/00

U.S. Cl. 431—4 **9 Claims**



Combustion control apparatus for use with a burner of the type having a centrally located liquid fuel atomizer or a gas

ring or center fuel gas arrangement mounted to produce a cone of flame in a combustion chamber. The control apparatus includes a ring of nozzles disposed around the burner and adapted to direct a jet or spray of water or other fluid, such as a slurry or air borne solids onto the flame and an additional duct adapted to direct a stream of air or other fluid onto the flame. The fluid is adapted to eliminate excessively hot combustion zones by cooling the flame at such zones and eliminating temperature peaks for thereby increasing the period of combustion in the chamber so as to reduce or eliminate the formation of undesirable oxidation products which are formed at high temperature.

3,748,081

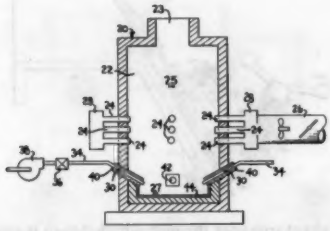
METHOD AND APPARATUS FOR DISPOSAL OF LIQUID WASTE

John D. Hummell, Brice, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 19,833, March 16, 1970, abandoned. This application May 20, 1971, Ser. No. 145,342

Int. Cl. F23g 7/04

U.S. Cl. 431—7 **10 Claims**



Disposal apparatus for burning liquid fuel waste comprises a vaporizing surface disposed below a combustion zone and adapted to receive the liquid fuel. The vaporizing surface can be a movable channel extending outside of the apparatus. In operation, the fuel is introduced into the apparatus in liquid form and then vaporized and burned.

3,748,082

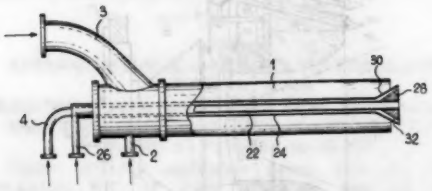
METHOD FOR CRACKING AND BURNING HYDROCARBONS

Alix Ivernel, Paris (7eme), France, assignor to L'Air Liquide, Societe Anonyme pour L'Etude et Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 42,259, June 1, 1970, Pat. No. 3,649,206. This application Jan. 27, 1972, Ser. No. 191,497

Int. Cl. C10b 57/00

U.S. Cl. 431—8 **8 Claims**



Hydrocarbons are cracked and burned by forming a combustible mixture of a fuel gas and a combustion-supporting gas, establishing a central stream of hydrocarbons to be cracked and burned, surrounding said stream of hydrocarbons with said combustible mixture, directing an annular stream of gas richer in oxygen than air between said central stream and said combustible mixture, and combusting the combined streams. The luminosity of the flame is thereby increased and the quantity of carbon black which is produced is also increased.

3,748,083

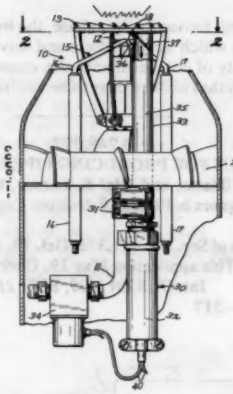
IGNITION FAILURE SHUTDOWN APPARATUS

John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Continuation of Ser. No. 41,131, May 25, 1970, abandoned. This application Mar. 10, 1972, Ser. No. 233,798

Int. Cl. F23q 3/00

U.S. Cl. 431—66 **3 Claims**



A burner for burning combustible fuel, such as fuel oil, having a continuous electrical spark ignition device, and further including a light conducting tube for receiving light from the spark ignition device, while excluding light from the burning fuel, and conducting the light to an ultraviolet detector which controls a valve to allow fuel to pass to the burner only when the ignition device is operating.

3,748,084

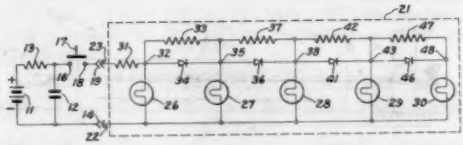
PHOTO-FLASH FIRING CIRCUIT EMPLOYING PARALLEL RESISTOR-DIODE COMBINATIONS

Sang-Chul Kim, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,445

Int. Cl. F21k 5/02

U.S. Cl. 431—95 **11 Claims**



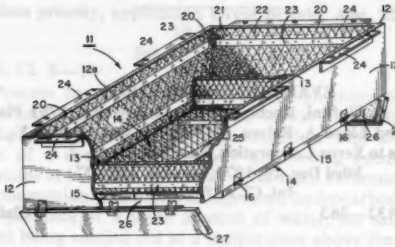
A plurality of parallel resistor-diode combinations are successively connected in series between a plurality of photoflash lamps, so as to connect the flash lamps into an electrical parallel circuit through the resistor-diode combinations. An end of the parallel circuit is adapted to be connected across a source of firing pulses. Each successive firing pulse will flash a different lamp. In a further embodiment, additional resistors are connected between the aforesaid end of the circuit and the respective resistor-diode combinations.

3,748,085

FURNACE SILENCERS

James R. Poepsel, 1410 Greenwood Dr., and Paul S. Weber, 1410 Sherwood, both of Baytown, Tex.

Filed Mar. 10, 1972, Ser. No. 233,702
Int. Cl. F23c 7/04
U.S. Cl. 431—114 10 Claims



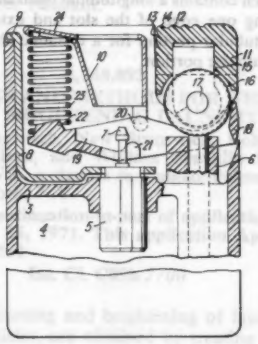
The noise generated by the burners of industrial furnaces is suppressed by attaching to the bottom of the furnace below the burners a chamber which is internally insulated with acoustical insulation means and which is provided with at least one similarly insulated baffle member over which the air fed to the burners must flow from adjustable dampened air intake means. The bottom of the chamber is provided with the air intake means and with outwardly openable inwardly insulated doors providing access to the furnace burners during operation.

3,748,086

CIGARETTE LIGHTER

William Retzler, Wickman, England, assignor to Colibri Lighters Limited, London, England

Filed Aug. 30, 1971, Ser. No. 175,899
Claims priority, application Great Britain, Sept. 9, 1970, 43,226/70
Int. Cl. F23q 2/08
U.S. Cl. 431—131 12 Claims



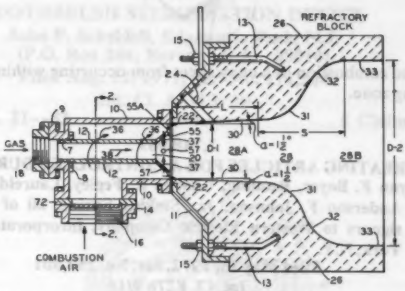
The invention is concerned with a cigarette lighter having an actuating member and means mounting said actuating member for rocking movement to operate said lighter, said actuating member having first and second surfaces meeting at a nose and the arrangement being such that when thumb pressure is applied to said first surface said actuating member is forced to rock with a snap action as said thumb rolls over said nose onto said second surface.

3,748,087

BURNER APPARATUS AND METHOD FOR FLAME PROPAGATION CONTROL

Howard Edward Shular, North Olmsted, Ohio, assignor to Pyronics, Inc., Cleveland, Ohio

Filed Oct. 14, 1971, Ser. No. 189,447
Int. Cl. F23m 9/00
U.S. Cl. 431—182 3 Claims



A burner apparatus comprises a fuel burner and flame tunnel in combination. The tunnel is of a suitable refractory material and is substantially goblet-shaped in cross section, comprising a first substantially cylindrical section and a second cup-shaped section, both sections being disposed along a common, longitudinal axis. The first, substantially cylindrical section diverges in the direction of fuel and air flow at an angle of not more than about 3° and preferably about 1½° from a theoretical cylindrical surface. The second, cup-shaped section faces the furnace side of the tunnel and diverges from its longitudinal axis in a convexo-curved section, then a concavo-curved section and then terminates in a substantially cylindrical section at its outlet end. The outlet diameter is at least as great as the distance along the longitudinal axis of the curved segments of the second, cup-shaped section, and is at least two and one-half times and preferably four times as great as the inlet diameter of the first, substantially cylindrical section.

Fuel and a first portion of combustion air are introduced with a rotational motion into the first section of the flame tunnel. A second portion of combustion air is injected at high velocity into the fuel/air admixture in a direction substantially transverse to the direction of flow through the flame tunnel. Combustion takes place in the flame tunnel, and a high kinetic energy is imposed upon the burning gas and air mixture within the confines of the first substantially cylindrical section. The injected, high velocity second portion of combustion air and the expanded, cup-shaped flame tunnel provide a full cross section highly radiating flame within the flame tunnel.

3,748,088

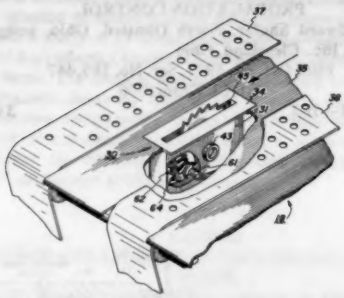
FUSER CONTROL APPARATUS

Thomas J. Mooney, and Thomas Lynch, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 2, 1972, Ser. No. 259,282
Int. Cl. G01p 3/00; H05b 3/00
U.S. Cl. 432—46 8 Claims

Apparatus is herein disclosed for detecting the occurrence of a hazardous condition within a xerographich heat fuser and,

in response thereto, for taking appropriate action to prevent



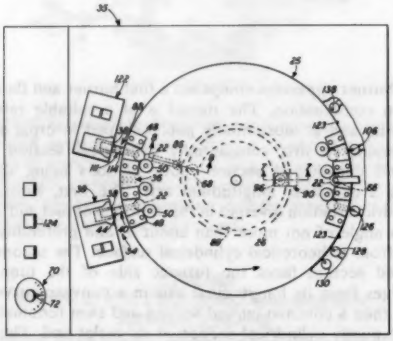
the combustion of a copy sheet from occurring within the fusing zone.

3,748,089

TREATING ARTICLES FOR A CONTROLLED DURATION

Lynn F. Boyer, Reading; Charles R. Fegley, Laureldale, and Anderson F. Johnson, Jr., Sinking Spring, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,601
Int. Cl. F27b 9/16
U.S. Cl. 432—52 18 Claims



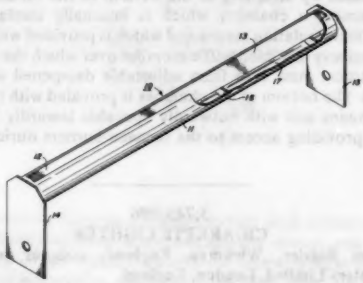
In a method and apparatus for baking photoresist on semiconductor slices, the length of baking time is controlled independently of the number of slices being baked or the position of the first slice placed on a rotary baking table. The position of the first slice is detected photoelectrically and marked with a magnet. The magnet actuates a combination selector-stepping switch each revolution of the rotary table. Continuity through the switch after a preselected number of revolutions initiates slice removal and, thereby, controls the baking time.

3,748,090

EVAPORATION CRUCIBLE

Anthony J. Ciuffini, Rochester; Joseph J. Galen, 1791 Plank Rd., and Lloyd A. Relyea, both of Webster, all of N.Y., assignors to Xerox Corporation, Stanford, Conn.

Filed Dec. 20, 1971, Ser. No. 209,607
Int. Cl. F27b 21/04
U.S. Cl. 432—263 4 Claims



An evaporation crucible which comprises a central tubular section which contains a longitudinal open slot. A plate is connected along one edge of the slot and extends at an angle within the tubular portion for a distance short of the inside wall of the tubular portion.

CHEMICAL

3,748,091

PROCESS FOR DYEING POLYESTER TEXTILES

David Melville Fawkes, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,183
Claims priority, application Great Britain, Apr. 22, 1970, 19,288/70
Int. Cl. D06p *1/20*
U.S. Cl. 8—39 6 Claims

Process for dyeing or optically brightening cellulose triacetate and aromatic polyester textile materials which comprises treating said textile materials with a dispersion of a dyestuff or optically brightening agent which contains at least one optionally substituted carbonamido or sulphonamido group in a halogenated hydrocarbon and in the presence of a small amount of water, the said treatment being carried out at a temperature above the boiling point of the azeotrope of the halogenated hydrocarbon and the water, and at a pressure above atmospheric pressure.

3,748,092

INCREASED RUB FASTNESS OF TEXTILE ARTICLES

Harry L. Mercer, Cheraw, and William Thomas White, Patrick, S.C., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,711
Int. Cl. D06p *5/02*
U.S. Cl. 8—74 10 Claims

A process for increasing the resistance to rubbing and crocking of dark shades of fabric such as wool, polyester, and the like. Protection of the surface of the dyed goods is effected by padding with an aqueous dispersion of collagen of molecular weight from about 20,000 to about 80,000. The padded material is then dried. When a finish of maximum resistance to water is desired, a formaldehyde producing compound, such as a urea formaldehyde resin, trioxane, and the like, can be added to the bath or can be used in the form of an after treatment. The effect is to partially tan the collagen, rendering it highly water resistant.

3,748,093

COMPOSITIONS AND METHODS FOR WHITENING AND BRIGHTENING LAUNDRY

William J. Gangwisch, New Brunswick, Robert Henry Trimmer, Edison, and William Franklin Gross, Jr., Piscataway, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 166,002, July 26, 1971. This application Apr. 3, 1972, Ser. No. 240,851
Int. Cl. C09b *7/00*
U.S. Cl. 8—137 19 Claims

Improved whitening and brightening of laundry, especially cotton articles, are obtained by treating such laundry with an aqueous solution of blue dye or mixture of such dyes which is substantive to the articles of laundry and is capable of tinting them with a slight blue color, removable by a chlorine bleach, and a fluorescent brightener substantive to the articles and resistant to chlorine and sunlight bleaching. The dye or mixture of dyes gives the laundry a desirable blue tint when it is not subjected to chlorine or sunlight bleaching and when such bleaching is effected and the blue is bleached (it is no longer needed to counteract any yellow of the laundry because that, too is bleached) the bleach-stable brightener exerts its brightening effect. Unlike treatments wherein bleach-resistant dyes are employed, any buildup of bluing due to repeated treatments may be removed.

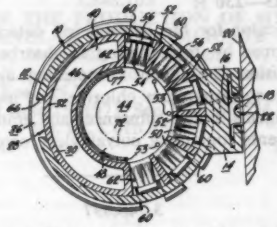
Also disclosed are compositions of such mixed dyes and brightener, and detergent compositions containing them.

3,748,094

TOOTHBRUSH STERILIZATION DEVICE

John P. Scheidell, Edgewater Park, N.J. (P.O. Box 246, Beverly, N.J. 08010)

Filed Aug. 12, 1971, Ser. No. 171,204
Int. Cl. A61l *3/00*
U.S. Cl. 21—83 5 Claims



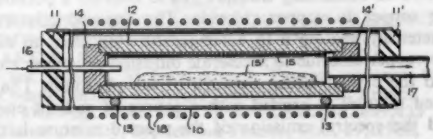
Apparatus for sterilizing toothbrushes by exposure of the bristle portions thereof to an ultraviolet light source within a shielded chamber of a substantially cylindrical shape with an ultraviolet lamp being centrally disposed in the sterilizing chamber. A rotatable brush holder assembly is adapted to receive a plurality of brushes and upon rotation to a sterilization position present the bristle portions of the brushes to the ultraviolet lamp. The brushes, except when in use, are thus continuously exposed to the germ-killing ultraviolet radiation.

3,748,095

PRODUCTION OF HIGH PURITY RARE EARTH SULFIDES

James R. Henderson, Los Angeles; Donald M. Johnson, Malibu, and Michiya Muramoto, Santa Monica, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed June 17, 1968, Ser. No. 737,770
Int. Cl. C22b *59/00*; C01f *17/00*
U.S. Cl. 423—21 9 Claims



Novel method for the production of high purity metal sulfides, selenides, tellurides, and arsenides, particularly those of

high melting point greater than 1,000° C, e.g., such compounds of the rare earth metals. An anhydrous metal, metal salt, metal oxide or mixtures thereof is contacted with a gas mixture, e.g., H_2S and CS_2 at a high temperature, e.g., in the range of about 1,250° C to about 1,325° C, in the substantial absence of water vapor and oxygen until the product has been formed. The metal sulfides, tellurides, selenides, and arsenides thus produced are formed into single crystals which are useful as semi-conductors, transistors, etc.

3,748,096

INDICATOR FOR THE DETECTION OF COPPER IONS

Dieter Schmitt, Alfred Stein, and Wilhelm Bäumer, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,543

Claims priority, application Germany, Aug. 7, 1970, P 20 39 242.1

Int. Cl. G01n *31/22*

U.S. Cl. 23—230 R 16 Claims

An indicator for the colorimetric detection of copper ions is formed by impregnating an absorbent carrier with a composition comprising complexing agents for Cu^+ ions, hydroxylammonium chloride and ascorbic acid as reducing agents, buffer substances and emulsifiers and/or wetting agents containing polyalkylene oxide groups.

3,748,097

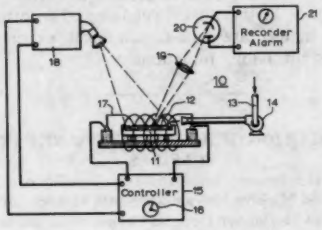
METHOD AND APPARATUS FOR DETECTING HALOGEN GROUP GAS

Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 2, 1972, Ser. No. 231,352

Int. Cl. G01n *21/24*

U.S. Cl. 23—232 E 10 Claims



A method of detecting chlorine gas entails mixing copper particles with a silver activated blue phosphor compound and exposing this mixture to an environment suspected of containing chlorine gas to convert a portion of the copper to copper chloride. The exposed mixture is reacted by heating it to a temperature sufficient to cause the copper chloride to accelerate diffusion of copper atoms into the crystal lattice network of the phosphor. The reacted mixture is excited with a source of radiant energy and the spectral emission of the reacted mixture is then detected and compared with the spectral emission of the blue phosphor compound to determine if a shift in spectral emission, which is indicative of the presence of chlorine, has occurred.

3,748,098

PORTABLE TESTING KIT FOR NARCOTICS AND DANGEROUS AND OTHER DRUGS

Paul H. Dutch, Los Angeles, Calif. (4500 La Barca Drive, Tarzana, Calif. 91356)

Filed May 24, 1971, Ser. No. 146,033

Int. Cl. B65d *83/00*; G01n *33/16*

U.S. Cl. 23—253 R 9 Claims

The kit is compartmentalized wherein one or more compartments retain breakable ampoules partially filled with extraction solvents and reagents and wherein another compartment receives the specimen containing the suspected narcotic, dangerous drug, or other drug. Upon breakage of the extraction solvent ampoule, the extraction solvent is flowed into the specimen compartment for extraction of the narcotic or dangerous or other drug from the specimen. The ampoule containing the reagent is then broken to mix the reagent with the extracted narcotic, dangerous drug, or other drug to react the two in order to produce a color which is characteristic and specific to the narcotic or dangerous or other drug. To obtain further and better specificity of the suspected substance, a third ampoule positioned in a further compartment may contain an organic fluid which is immiscible with the extracted and reacted narcotic, dangerous drug, or other drug so that separation will take place after mixing has been effected.

3,748,099

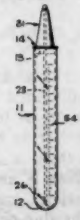
LIQUID HANDLING DEVICE

Heinz Eric Horlach, Sunland, Calif., assignor to Toluca Industries Corporation, North Hollywood, Calif.

Filed Sept. 7, 1971, Ser. No. 178,018

Int. Cl. B65d *39/00*; G01n *1/10*

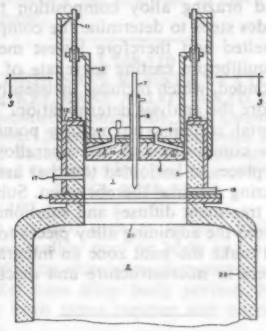
U.S. Cl. 23—259 3 Claims



A device for storing and transferring liquids, comprising an elongated container of resilient material, having

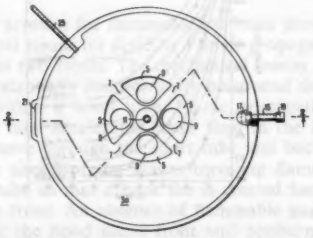
an open end sealed by a removeable closure provided with a sleeved port through which a thin, flexible pipette is slidably inserted with one end extending outwardly therefrom, and a hollow cap adapted to be seated releasably on the closure over the port and and the exposed portion of the pipette and to engage and seal the end of the pipette when so seated.

3,748,100
CARBON BLACK APPARATUS
Glenn J. Forseth, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 26, 1971, Ser. No. 137,438
Int. Cl. C09c *1/48*; F23c *5/06*
U.S. Cl. 23—259.5 **5 Claims**



A carbon black reactor comprised of a plurality of sections in contiguous relationship, the upstream wall of one of the reactors being positionable to alter the length of the first zone of the reactor.

3,748,101
CENTRIFUGE FLUID CONTAINER
Alan L. Jones, Endwell, and George T. Judson, Whitney Point, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 28, 1972, Ser. No. 221,530
Int. Cl. B01l *3/00*
U.S. Cl. 23—259 **4 Claims**

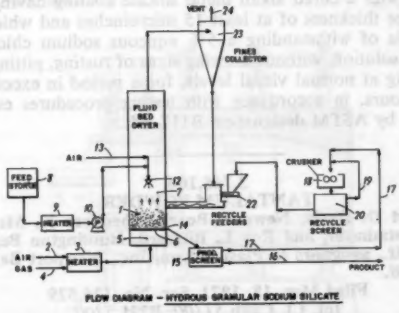


A fluid container particularly useful in a system for processing blood. The container is generally annular or toroidal in shape, with a central hub portion which communicates with the annular portion via a plurality of radial channels, and is preferably formed from two circular pieces of plastic material, sealed at the periphery, and in centrally-located segments to provide the desired configuration. A central hub provides one fluid entrance and exit. A peripherally-located output tube, appropriately sealed, is located opposite a slitted flap, to provide means for suspending the container from a support and draining the container by gravity through the outlet tube. A sampling tube may also be provided, connected to the periphery of the bag.

3,748,102
CESIUM DIDEUTERIUM ARSENATE CRYSTALLIZATION PROCESS AND SOLUTION
Ratan Shankar Adhav, 8 Durham St. E., Lindsay, Ontario, Canada
No Drawing. Filed Nov. 30, 1970, Ser. No. 93,868
Claims priority, application Canada, Dec. 19, 1969, 70,405
Int. Cl. B01j *17/04*; C01b *27/02*
U.S. Cl. 23—301 R **3 Claims**

In the present application there is disclosed a process for the production of crystals of cesium dideuterium arsenate of unusually large size and which crystals have unexpected electro-optical properties, particularly useful for laser applications as light modulators and Q switches. In the process sodium tetraborate is used as a catalyst and crystals having cross-sections of the order of one inch or more are obtained using a conventional Holden rotary crystallizer.

3,748,103
PROCESS FOR THE PRODUCTION OF HYDROUS GRANULAR SODIUM SILICATE
Samuel L. Bean, Jamesville, and Anthony W. Montone, Elbridge, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.
Filed June 25, 1971, Ser. No. 156,774
Int. Cl. C01b *33/32*
U.S. Cl. 23—313 **15 Claims**



FLOW DIAGRAM — HYDROUS GRANULAR SODIUM SILICATE

A granular hydrous sodium silicate product the granules of which comprise agglomerated particles, the Na_2O/SiO_2 ratio of said product ranging from 1:1.0 to 1:3.2 with a water content of 10 to 20% by weight is made by a process for the production of said product involving the dispersion of an aqueous solution of sodium silicate into a fluid bed zone, removing a portion of the bed, controlling operating variables to maintain the moisture content of the bed within prescribed limits and recycling a quantity of the material removed.

3,748,104
EXTRACTION OF TRANSPLUTONIUM ELEMENTS FROM AN AQUEOUS SOLUTION CONTAINING RARE EARTHS AND FISSION PRODUCTS
Gerard Koehly, Maisons-Alport, France, assignor to Commissariat a l'Energie Atomique, Paris, France
No Drawing. Filed Mar. 21, 1969, Ser. No. 809,433
Claims priority, application France, Mar. 29, 1968, 146,356
Int. Cl. B01d *11/00*
U.S. Cl. 423—10 **2 Claims**

A method of treatment of aqueous solutions containing transplutonium elements, rare earths and fission products

and more precisely a method of removal of fission products from these solutions, characterized in that the acid concentration of said solutions is adjusted to a normality which is higher than 1 N and that said solutions are contacted with an organic phase consisting of an organophosphorus acid diluted in a solvent which is immiscible with water, the fission products being extracted by said organic phase.

3,748,105

CORROSION RESISTANT POWDER METAL PARTS

Orville W. Reen, Lower Burrell, and Jesse R. Conner, Pittsburgh, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 762,968, Sept. 26, 1968. This application Feb. 25, 1971, Ser. No. 119,040

Int. Cl. B22f *7/08*

U.S. Cl. 29—182.1 **12 Claims**

A method of providing a powder metal article subjected to a corrosive halogen ion containing environment with corrosion resistance thereto, which comprises the steps of: pressing metal powder into a green compact; sintering the green compact in a substantially non-oxidizing atmosphere, thereby forming a sintered article; substantially impregnating and coating the sintered article with an aqueous alkali metal silicate solution; curing the solution at a temperature of at least about 300° F. to drive off the water radical of the solution, and render the article porous and the silicate impregnant and coating water insoluble; and placing the article into service in a corrosive halogen ion containing environment.

A pressed and sintered porous powder metal article coated both externally and internally along porous passages with a cured alkali metal silicate coating having an average thickness of at least 15 microinches and which is capable of withstanding a 5% aqueous sodium chloride spray solution, without showing signs of rusting, pitting or staining at normal visual levels, for a period in excess of 100 hours, in accordance with testing procedures established by ASTM designation B117–64.

3,748,106

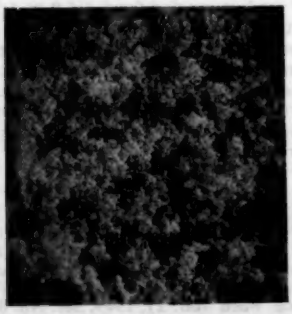
TANTALUM POWDER

Robert D. Davis, Newport Beach, Theodore N. Meyer, Westminster, and Roy L. Blizzard, Huntington Beach, Calif., assignors to Plasmachem, Inc., Newport Beach, Calif.

Filed Mar. 18, 1971, Ser. No. 125,529

Int. Cl. C22b *51/00*; B22f *5/00*

U.S. Cl. 29—192 **9 Claims**



An in situ produced elemental refractory metal powder of coherent sponge form consisting essentially of interconnected particles exhibiting necking properties wherein a majority of the particles are larger than one micron in size and the major portion of the individual particles have smooth, vermicular configurations as opposed to sharp, angular plate-like shapes.

3,748,107

SUPERALLOY EUTECTIC BRAZE

Lemuel A. Tarshis, Latham, and James L. Walker, Schenectady, N.Y., and Thomas F. Berry, Greenhills, Ohio, assignors to General Electric Company

Continuation-in-part of application Ser. No. 97,915, Dec. 14, 1970, now Patent No. 3,696,500, dated Oct. 10, 1972. This application May 25, 1971, Ser. No. 146,695

Int. Cl. B32b *15/00*; C22c *19/00*

U.S. Cl. 29—194 **3 Claims**

A method of forming an integral joint bonding together superalloy pieces, particularly of nickel-base superalloys, and improved brazing alloy composition therefor. The process includes steps to determine the composition of an incipiently melted and therefore lowest melting portion of the non-equilibrium casting segregate of a superalloy piece to be bonded, which includes incipiently melting the segregate before the analysis determination. The prepared brazing material contains no melting point depressants foreign to the composition of the superalloy piece to be bonded. The pieces to be joined together are heated with the novel brazing material therebetween. Subsequent progressive heat treatment diffuses and solutionizes the brazing material into the adjoining alloy pieces to homogenize the bond and make the joint zone an integral part of the joined members in microstructure and mechanical properties.

3,748,108

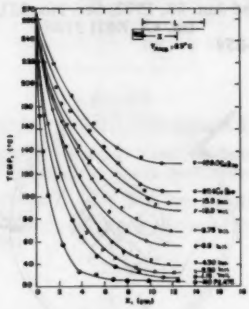
THERMALLY ACTIVATED SPRING WITH IMPROVED THERMAL PROPERTIES

Frederick Rothwarf and Paul D. Flynn, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of the Army

Filed Apr. 7, 1970, Ser. No. 26,367

Int. Cl. B32b *15/00*

U.S. Cl. 29—195.5 **11 Claims**



A thermally activated spring of martensite transformation material which has improved thermal diffusivity and methods of making same. Martensite transformation materials, such as NiTi and AuCd, are able to "remember" a given high temperature phase shape and may be used as thermally activated springs. Since these materials are poor heat conductors, their thermal diffusivity may be enhanced by layering them with a material having a much higher thermal diffusivity, such as copper or silver. Another method of achieving improved thermal diffusivity is to use a core of copper or silver layered with the martensite transformation material.

3,748,109
CONDUCTIVE DESIGNS AND PROCESS FOR THEIR MANUFACTURE

Sung Ki Lee, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 727,045, May 6, 1968, now Patent No. 3,625,730. This application June 11, 1971, Ser. No. 152,395
The portion of the term of the patent subsequent to Dec. 7, 1988, has been disclaimed
Int. Cl. C23b *5/48, 5/60;* B23p *3/00*
U.S. Cl. 29—195 22 Claims

Printed circuits, integrated circuits, resistors, thermocouples, condensers, superconductors, electroformed materials, and the like are produced by providing a plastic or substantially non-metallic substrate with a metal phosphorus compound; applying a resist; removing the unprotected metal phosphorus compound; dissolving the resist; and subjecting the substrate to electroless or electrolytic treatment.

3,748,110
DUCTILE-CORROSION RESISTANT COATING FOR NICKEL BASE ALLOY ARTICLES

James O. Hodshire, Mooresville, and Quentin O. Shockley and Robert Martin, Jr., Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

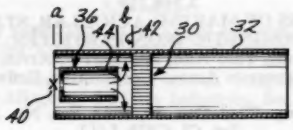
Filed Oct. 27, 1971, Ser. No. 192,938
Int. Cl. B32b *15/20*
U.S. Cl. 29—197 3 Claims

Composite articles, such as turbine blades, having a nickel base superalloy core or body and a surface layer formed by diffusing aluminum, manganese and chromium into the nickel base alloy body portion, have excellent resistance to both stress rupture and corrosion at high temperatures.

3,748,111
FLAME ARRESTOR

Walter K. Klose, 22722 10th Ave. S., Seattle, Wash. 98188

Filed June 11, 1971, Ser. No. 152,239
Int. Cl. F17d *3/00;* F23d *13/46*
U.S. Cl. 48—192 10 Claims



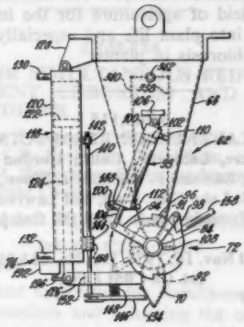
A flame arrestor for flammable gas vents provided with a mechanical means for dividing a single propagating flame into at least two fronts. The mechanical means may comprise a substantially concentrically positioned shorter tube disposed within a hood tube. Flame propagation in the concentric tube accelerates faster than in the hood tube and will move through the short tube and back into the hood tube ahead of the slower-traveling flame front in the hood tube so that a back fire is created for the hood tube flame front. An absence of flammable gas supply is created for the hood flame front and nonburnable inert gases are supplied instead so that both flame fronts automatically extinguish.

3,748,112
APPARATUS FOR TRANSFER OF PARTICULATE MATERIAL IN GLASS MELTERS

Samuel D. Phillips, Welsh Hills Road, Granville, Ohio 43023

Filed Sept. 17, 1970, Ser. No. 72,905
Int. Cl. C03b *3/00*
U.S. Cl. 65—335 12 Claims

Apparatus for transferring particulate material to a high temperature region for thermal processing including means for intermittently transporting particulate material from a location away from the high temperature region

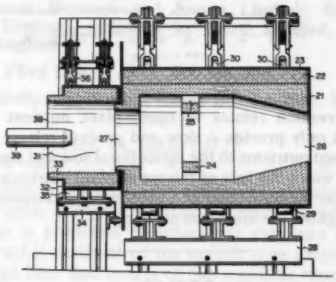


to a location at a collection surface in the high temperature region and means for releasing the particulate material from the location at the surface.

3,748,113
GLASS MELTING APPARATUS

Akira Ito, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 28, 1971, Ser. No. 213,075
Claims priority, application Japan, Dec. 29, 1970, 46/121,480, 46/121,481, 46/121,482
Int. Cl. C03b *3/00, 5/10*
U.S. Cl. 65—335 3 Claims



A glass melting apparatus comprising a cylindrical member containing a glass melting chamber; a cylindrical flue fitted to the top of said cylindrical member whose lower end projects into the glass melting chamber; a burner for simultaneously ejecting raw glass materials and fuel into the glass melting chamber in the tangential direction of the periphery of that portion of the flue which is disposed in said chamber; and glass purifying means for centrifugally removing air bubbles occluded in the molten glass so as to purify the product glass.

3,748,114
SYNERGISTIC METAL CHELATES

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application July 13, 1970, Ser. No. 54,661, now Patent No. 3,677,956. Divided and this application Apr. 21, 1972, Ser. No. 246,490
Int. Cl. C05f *11/00*
U.S. Cl. 71—1 6 Claims

Mixtures of tris(hydroxymethyl)phosphine oxide, and iminodiacetic acid as well as the alkali metal salts thereof,

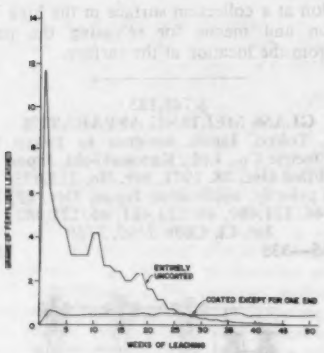
exhibit marked synergism as sequestrant compositions over a broad pH range. The sequestrant compositions are useful as additives for detergents, metal cleaning baths, peroxide compositions and dyes. The chelate products are useful in the field of agriculture for the introduction of trace elements into plant life and especially in the treatment of iron chlorosis in plants.

3,748,115

PLANT NUTRIENT PRODUCTS

Harry J. Sommer, Lafayette, Calif.; Gordon A. McLaren, Houston, Tex.; Edmund F. Feichtmeir, Ripon, Calif.; Robert G. Larsen, Salt Lake City, Utah, and Lawrence E. Wittsell, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 16, 1971, Ser. No. 201,594
Int. Cl. C05f *11/00*
U.S. Cl. 71—64 F 8 Claims



This invention relates to novel plant nutrient products which not only provide a slow and gradual release of water soluble plant nutrients to the agricultural soil, but also afford a means by which the rate of release of plant nutrients from the product can be controlled at a substantially constant (linear) rate throughout the life of the product.

3,748,116

METHOD FOR PRODUCING METALLIC IRON POWDER FROM IRON ORE CONCENTRATE

George G. Reed, Jr., Oakville, Ontario, Canada, and Janusz M. Karpinski and Sidney V. Fox, Bethlehem, Pa., assignors to Bethlehem Steel Corporation

No Drawing. Filed Aug. 24, 1970, Ser. No. 66,564
Int. Cl. C21b *1/08, 1/28*
U.S. Cl. 75—3 14 Claims

A method for producing iron powder containing about 0.60% silica from iron ore concentrate. The iron ore is beneficiated by any one of several commercial processes, such as froth flotation. The iron ore concentrate is mixed with an organic binder, such as lignin, and is balled. The green balls are dried and, then, together with a solid carbonaceous reductant and a desulfurizing agent, are charged into one end of a rotary kiln. The iron ore in the green balls is reduced to metallic iron at a temperature of about 1900° F. to 2200° F. The pellets, excess solid reductant and desulfurizing agent are discharged from the kiln. The metallic pellets are recovered and subjected to impact grinding. The ground material is beneficiated by magnetic separation. The magnetic portion is annealed and reground to a suitable size distribution and the metallic iron is recovered as a usable product.

3,748,117

PROCESS OF MAKING A WAELZ OXIDE CONTAINING SINTER FOR USE IN ZINC SMELTING FURNACES

Manfred Schmidt, Oberstedten, and Fred Stieler, Heusenstamm, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed Sept. 7, 1971, Ser. No. 178,446
Claims priority, application Germany, Sept. 10, 1970, P 20 44 739.6
Int. Cl. C22b *19/02*
U.S. Cl. 75—5 10 Claims

A Waelz oxide containing sinter for use in zinc smelting shaft furances is made by subjecting the Waelz oxide to a separate homogenizing moistening and compacting step prior to adding it to the sinter mixture.

3,748,118

PROCESS FOR PREPARING FINELY PARTICLED METALLIC NICKEL POWDER HAVING A SPHEROIDAL FORM

Franco Montino, Casale Monferrato (Alessandria), and Franco Guerriere, Novara, both of Italy, assignors to Monticatini Edison S.P.A., Milan, Italy

Filed Dec. 21, 1971, Ser. No. 210,608
Claims priority, application Italy, Dec. 24, 1970, 33530 A/70
Int. Cl. B22f *9/00*
U.S. Cl. 75—0.5 AA 7 Claims

A process is disclosed for preparing finely divided, homogeneous, metallic nickel powder with a very narrow granulometric spectrum having a spheroidal form and with a granulometric range between 0.07 and 2 microns, characterized in that a hydroalcoholic suspension of a nickel compound selected from the class consisting of the hydroxide, the formate and the acetylacetonate is treated with hydrogen at temperatures ranging from 160° to 250° C and at hydrogen partial pressures ranging from 25 to 100 atm, in the presence of one or more additives selected from the class consisting of acrylonitrile, pyridine, and complexes of zerovalent nickel.

3,748,119

PROCESS OF MAKING ACICULAR, STABLE MAGNETIC IRON PARTICLES

Paul Y. Hwang, Palo Alto, and Earl F. Arvin, Belmont, Calif., assignors to Ampex Corporation, Redwood City, Calif.

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,452
Int. Cl. C22b *5/12*
U.S. Cl. 75—.5 AA 7 Claims

Acicular iron particles are made by doping an acicular ferric oxide with bismuth and a water soluble or dispersible silicon compound and reducing the thus doped oxide to iron at a relatively low temperature. The particles are stabilized by reoxidizing the surface slightly. The use of silicon in addition to bismuth yields iron particles of improved coercivity and acicularity.

3,748,120

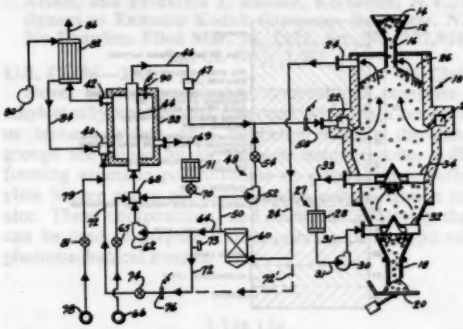
METHOD OF AND APPARATUS FOR REDUCING IRON OXIDE TO METALLIC IRON

Donald Beggs and John C. Scarlett, Toledo, Ohio, assignors to Midland-Ross Corporation, Toledo, Ohio

Continuation of abandoned application Ser. No. 739,377, June 24, 1968. This application Apr. 15, 1971, Ser. No. 134,476
Int. Cl. C21b *13/02*
U.S. Cl. 75—35 6 Claims

This invention relates to a method and apparatus for reducing iron oxide to metallic iron, utilizing a continuous process employing a reducing gas with a high H_2 and CO content made by catalytically reforming a mixture of gaseous hydrocarbon and reacted off-gas from the reduction

process. The CO_2 plus H_2O present in the reacted off-gas are utilized as the hydrocarbon reforming oxidant, without the addition of reforming oxidant from an external source.



3,748,121

TREATMENT OF MOLTEN FERROUS METALS

Robert Edwin Atterbury, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Mar. 29, 1971, Ser. No. 129,144

Claims priority, application Great Britain, Apr. 20, 1970, 18,693/70

Int. Cl. C21c 7/02

U.S. Cl. 75—58 3 Claims

Molten ferrous metals may be desulpherized with an additive comprising lime, sodium carbonate, fluorspar and not more than 0.25 percent by weight metal chloride.

3,748,122

METHOD FOR DYNAMICALLY CONTROLLING DECARBURIZATION OF STEEL

Sundaresan Ramachandran, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Brackenridge, Pa.

Original application Oct. 30, 1968, Ser. No. 771,752, now Patent No. 3,594,155. Divided and this application May 4, 1971, Ser. No. 140,085

Int. Cl. C21c 7/04

U.S. Cl. 75—60 3 Claims

Described herein is a method of dynamically controlling decarburization of steel by measuring the rate of carbon removal from the steel, measuring the rate of oxidizer input, continuously maintaining a balance between the aforementioned rates by adjusting the carbon-oxygen reaction rate and/or adjusting the input of oxidizing material to the steel.

3,748,123

PROCESS FOR METAL RECOVERY

Lubertus Bakker, South Euclid, Ohio, assignor to Bakker Development Corp., Cleveland, Ohio

Filed July 14, 1971, Ser. No. 162,650

Int. Cl. C22b 7/00

U.S. Cl. 75—97 4 Claims

Metals, particularly precious metals, embedded in or otherwise confined by enzyme-degradable organic media as in photographic film or printed circuits are recovered in the form of metal or metal compounds by breakdown of said media primarily by enzymes.

3,748,124

METHOD FOR SIMULTANEOUS REDUCTION OF HEXAVALENT CHROMIUM AND CEMENTATION OF COPPER

Oliver P. Case, Naugatuck, Ronald B. L. Jones, Watertown, Robert D. Spellman, Bethlehem, and Joseph W. Archambault, Waterbury, Conn., assignors to Anaconda American Brass Company

Filed Jan. 11, 1971, Ser. No. 105,380

Int. Cl. C22b 25/04

U.S. Cl. 75—109 7 Claims

A method and apparatus for simultaneously reducing hexavalent chromium and achieving the cementation of copper from a solution containing soluble copper compounds and hexavalent chromium compounds, including adding sulfuric acid to the solution in sufficient quantities to maintain a pH in the range of about 1.5 to about 3.0 and introducing the solution into a rotatable inclined chamber having iron-containnig objects therein to accomplish both the reduction of the hexavalent chromium and the cementation of a substantial portion of the copper. Cemented copper is separated from the treated solution and the solution may then be reprocessed for further copper removal.

3,748,125

COLOR ELECTROPHOTOGRAPHY USING TONERS OF THE REPELLENT TYPE

Robert James Hercock and Simon Lindsay, Scrutton, Ilford, England, assignors to Ilford Limited, Ilford, Essex, England

Filed Dec. 9, 1971, Ser. No. 206,415

Claims priority, application Great Britain, Dec. 9, 1970, 58,511/70

Int. Cl. G03g 13/22

U.S. Cl. 96—1.2 4 Claims

This invention relates to the processing of colour electrophotographic material to yield a mutlicoloured image. Such image is produced by imagewise exposure of electrophotographic material of the mosaic type employing a latent image fixer and toners of the repellent type, which are so selected that they will not deposit on the areas covered by previously applied coloured toners, even though such areas have not been discharged by exposure to light.

3,748,126

MULTIPLE COPY SELECTIVE RE-WETTING PRINTING

Robert M. Ferguson, Monroe, N.Y., and Richard J. Komp, Warren, Ky., assignors to Xerox Corporation, Rochester, N.Y.

Continuation of application Ser. No. 887,838, Dec. 24, 1969. This application Jan. 28, 1972, Ser. No. 221,602

Int. Cl. G03g 13/14

U.S. Cl. 96—1.4 12 Claims

A method is provided for producing a plurality of copies of an original by an electrostatographic process requiring only a single electrostatic latent image. After development of the latent image with liquid developer, the developed image is partially transferred to a copy web leaving behind a residual liquid film in image configuration. This residual liquid film is then redeveloped with liquid developer to form additional copies without

further need of the latent image. Redevelopment can be accomplished after discharge of the latent image to below the development threshold.

3,748,127

TREATMENT OF REUSABLE PHOTOCONDUCTIVE SURFACES WITH LEWIS ACIDS OR BASES

Alan B. Amidon and Joseph Mammino, Penfield, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 838,328, July 1, 1969. This application Dec. 2, 1971, Ser. No. 204,325

Int. Cl. G03g *13/10, 13/16*

U.S. Cl. 96—1 LY 5 Claims

An electrostatographic imaging system employing a liquid developer and a cycling or reusable protoconductor is provided wherein a small amount of a Lewis acid or Lewis base is cyclically applied to the photoconductor surface. The Lewis acid or base is preferably a constituent of the liquid developer and acts to maintain or rejuvenate the electrical properties of the photoconductor.

3,748,128

PROCESS IN WHICH HETEROCYCLIC-N-ALKOXIDES AND ACYLOXIDES EXHIBIT AN IMAGEWISE CHANGE IN TRIBOELECTRIC CHARGING PROPERTIES

James G. McNally, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 51,349, June 30, 1970. This application May 24, 1972, Ser. No. 256,606

Int. Cl. G03g *5/02, 13/14, 13/22*

U.S. Cl. 96—1.4 34 Claims

Visible images corresponding to latent electrostatic charge images are produced on eneroresponsive layer, i.e., responsive to various forms of energy such as electromagnetic radiation, heat, pressure, vibration (e.g. from exposure to sound waves), having incorporated therein an energy-sensitive heterocyclic alkoxide or heterocyclic acyloxide material which exhibits a change in triboelectric series position upon impingement by activating energy, by means of an enerographic process which comprises (a) imagewise exposing the eneroresponsive layer to energy capable of providing an imagewise change in triboelectric series position, (b) differentially triboelectrically charging the surface of the exposed eneroresponsive layer imagewise to form an electrostatic charge pattern thereon and (c) developing the electrostatic charge pattern by contacting the charged surface with a developer composition containing electrostatically attractable toner particles, to form a pattern of the toner particles on the charged surface corresponding to the non-exposed or the exposed regions.

3,748,129

DYE IMAGE PROVIDING MATERIALS WITHIN DIFFUSION TRANSFER BARRIER LAYERS

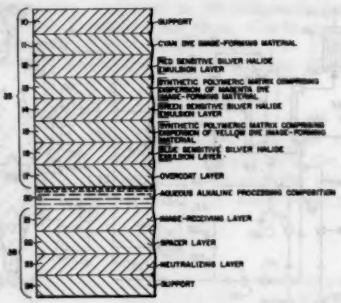
James A. Avtges, Belmont, Jerome L. Reid, Wayland, Herbert N. Schlein, Beverly, and Lloyd D. Taylor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 6, 1971, Ser. No. 205,053

Int. Cl. G03c *7/00*

U.S. Cl. 96—3 20 Claims

Diffusion transfer photographic products comprising a support carrying at least two selectively sensitized silver halide emulsion layers each having a dye which is preferably a silver halide developing agent of predetermined color associated therewith, at least one of said dyes being present as a dispersion in a layer immediately adjacent its associated silver halide emulsion layer said dispersion matrix comprising a polymer which is permeable to hydroxyl ion and solubilized dye at a rate which insures substantial development of each dye associated silver halide emulsion layer prior to contact of such layer with


SUPPORT
CYAN DYE IMAGE-FORMING MATERIAL
RED SENSITIVE SILVER HALIDE EMULSION LAYER
SYNTHETIC POLYMERIC MATRIX COMPRISING DISPERSION OF MAGENTA DYE IMAGE-FORMING MATERIAL
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER
SYNTHETIC POLYMERIC MATRIX COMPRISING DISPERSION OF YELLOW DYE IMAGE-FORMING MATERIAL
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER
OVERCOAT LAYER
AQUEOUS ALKALINE PROCESSING COMPOSITION
IMAGE-RECEIVING LAYER
SPACER LAYER
NEUTRALIZING LAYER
SUPPORT

substantial amounts of solubilized unassociated dye material.

3,748,130

NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

Arnold Hoffman, Brookline, and Bernard Zuckerman, Framingham, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Aug. 9, 1971, Ser. No. 170,344

Int. Cl. G03c *5/54, 7/00, 1/34*

U.S. Cl. 96—29 D 13 Claims

This invention relates to photographic silver halide emulsions containing sodium hypochlorite.

3,748,131

PHOTOSENSITIVE COMPOSITION AND ELEMENT COMPRISING LIGHT-SENSITIVE POLYMERS

George A. Reynolds, Thomas M. Laakso, Douglas G. Borden, and Jack L. R. Williams, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Application Jan. 16, 1970, Ser. No. 3,536, which is a continuation-in-part of abandoned application Ser. No. 854,303, Aug. 29, 1969. Divided and this application Feb. 25, 1972, Ser. No. 229,543

Int. Cl. G03c *1/60, 1/70*

U.S. Cl. 96—35.1 17 Claims

Novel light-sensitive polymers contain as the light-sensitive moiety a side chain which contains two ethylenically unsaturated groups conjugated to each other through an arylene group. Photosensitive compositions and elements prepared with these polymers are useful in the preparation of photomechanical images such as photoresists and lithographic printing plates.

3,748,132

PHOTOPOLYMERIZABLE COMPOSITIONS AND ELEMENTS AND USES THEREOF

Joseph A. Arcesi, Frederick J. Rauner, Robert C. McConkey, and John M. Noonan, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,928

Int. Cl. G03c *1/68*

U.S. Cl. 96—35.1 21 Claims

Novel photopolymerizable compositions comprise an ethylenically unsaturated sulfonate-carboxylate monomer, a film-forming aromatic polysulfonate or polysulfonate-carboxylate binder and a photoactivatable polymerization initiator. These compositions, and elements containing them, can be used to prepare resists, printing plates, and other photomechanical images.

3,748,133

PHOTOPOLYMERIZABLE COMPOSITIONS AND ELEMENTS AND USES THEREOF

John M. Noonan, Robert C. McConkey, Joseph A. Arcesi, and Frederick J. Rauner, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,929
Int. Cl. G03c 5/00
U.S. Cl. 96—35.1 21 Claims

Novel photopolymerizable compositions comprise an ethylenically unsaturated monomer which is a bisacrylate or bismethacrylate of a bisphenol wherein the phenol groups are joined by an aliphatic ketone group, a film-forming aromatic polysulfonate or polysulfonate-carboxylate binder and a photo-activatable polymerization initiator. These compositions, and elements containing them, can be used to prepare resists, printing plates, and other photomechanical images.

3,748,134

TREATMENT OF FROSTABLE LIGHT SENSITIVE ORGANIC LAYERS WITH WATER VAPOR, AFTER EXPOSURE, FOR OBTAINING FROSTED IMAGES IN UNEXPOSED AREAS

Rexford W. Jones and William B. Thompson, Columbus Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of application Ser. No. 796,897, Feb. 5, 1969. This application Mar. 10, 1971, Ser. No. 123,086
Int. Cl. G03c 5/24, 1/72
U.S. Cl. 96—48 HD 6 Claims

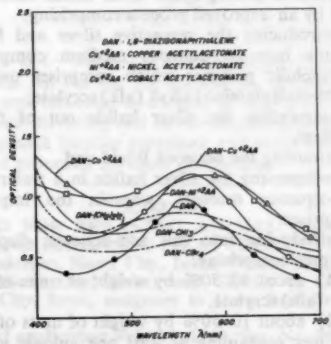
Frost patterns are produced by exposing a frostable light-sensiitve organic layer, comprising a film-forming frostable organic material, to actinic radiation in image-receiving manner to form a latent image and producing a frost image in the unexposed areas by contacting the exposed layer with water vapor.

3,748,135

PHOTOIMAGING PROCESSES AND COMPOSITIONS

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of abandoned application Ser. No. 147,116, May 26, 1971. This application May 18, 1972, Ser. No. 254,521
Int. Cl. G03c 1/52, 1/72, 5/18
U.S. Cl. 96—49 14 Claims



Dry photoimaging processes and compositions employing photosensitive coatings of a volatile peri-substituted aromatic azido compound and a spin-orbital coupling agent in a permeable film-forming plastic are disclosed.

3,748,136

PHOTOGRAPHIC SILVER BLEACHING SOLUTION

Josef Frans Willems, Wilrijk, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

No Drawing. Filed July 14, 1971, Ser. No. 162,611
Claims priority, application Great Britain, Aug. 10, 1970, 38,508/70
Int. Cl. G03c 5/26, 5/32, 7/16
U.S. Cl. 96—60 R 17 Claims

A method of bleaching silver images in photographic elements by means of negatively charged oxidizing agents is described wherein said bleaching is accelerated by the use of onium compounds in the bleaching solution or in a solution used prior to the bleaching solution. The method makes possible to use as oxidizing agents the inexpensive and colourless persulphates which are otherwise too slow for silver bleaching.

3,748,137

PHOTOSENSITIVE AND THERMOSENSITIVE ELEMENTS AND PROCESS FOR DEVELOPMENT

Joseph H. Worth; Howard A. Miller, and Clyde P. Glover, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1970, Ser. No. 97,022
Int. Cl. G03c 5/26, 1/94
U.S. Cl. 96—67 16 Claims

Thermosensitive and photosensitive elements, and a process for the development thereof, are provided which comprise a support, an electrolessly deposited layer of a conductive metal, and a photosensitive layer. Suitable electrolessly deposited layers include nickel, cobalt, and nickel-cobalt alloy. Suitable photosensitive materials include any heat developable or heat-stabilizable materials. Of particular interest are pohtosensitive elements comprising an electrolessly deposited metal in contact with a diazo composition, a heat developable oxidation-reduction image-forming composition, or a stabilizable print-out emulsion as set forth in Bacon et al., U.S. Pat. No. 3,447,927. Such elements may be developed or stabilized by the application of an electric current to the electrolessly deposited conductive metal, to produce heat.

3,748,138

METAL COMPLEX IN SILVER HALIDE DEVELOPMENT

Vernon L. Bissonette, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 14, 1971, Ser. No. 189,331
Int. Cl. G03c 5/30
U.S. Cl. 96—66.3 17 Claims

The rate of formation of metallic silver in the photographic process is increased by the use of a metal complex during photographic development.

3,748,139

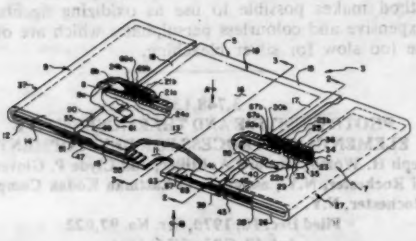
PHOTOGRAPHIC FILM UNIT ASSEMBLY

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,136
Int. Cl. G03c 1/48
U.S. Cl. 96—76 C 6 Claims

A film assembly of the self-processing type has certain of its component parts adapted to be separated by a severing device. The film assembly comprises a preregistered intergal film unit including a photosensitive element and a superposed process element having image portions that are separable to admit a processing composition therebetween, a processing composition container for supplying the composition to the film unit, and a processing composition receiver for receiving any excess composition from the film unit. Interposed between and extending beyond the photosensitive and process elements is a masking member for defining the image portions and a predetermined space therebetween, for connecting the two elements with each other and the film unit with

the container and receiver, and for directing the processing composition from the container to the image portions and the excess composition from said portions to the receiver. The receiver may be defined by one end of the masking member folded back upon itself to provide a main portion and a back-folded portion between which the excess composition is received. A processing-composition-activated adhesive is provided on appropriate surfaces of the masking member for sealing the two elements together and the receiver closed after the processing composition has been directed from the container to the image portions and the excess composition has been directed



to the receiver. To facilitate separation of the film unit from the container and receiver, means are provided for guiding a servering device along predetermined paths between the film unit and container and between the film unit and receiver, the guiding means including opposing guide surfaces defining elongate slots extending across the masking member for defining the predetermined paths and for guiding the severing device therealong. The masking member is adapted to be flexible along the predetermined paths in order to permit alternative folding of the container and receiver over one of the two elements to provide a backing for the finished print.

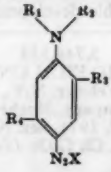
3,748,140

LIGHT-SENSITIVE DIAZOTYPE MATERIAL

Hans-Dieter Frommeld and Herbert Rauhut, Wiesbaden-Biebrich, Germany, assignors to Keuffel & Esser Company, Morristown, N.J.

No Drawing. Filed Sept. 4, 1969, Ser. No. 855,422
Claims priority, application Germany, Sept. 3, 1968, P 17 93 332.3
Int. Cl. C07c *113/04*; G03c *1/54*
U.S. Cl. 96—91 R **8 Claims**

Diazotype material includes a light-sensitive diazonium compound of the general formula



wherein

R_1 is a lower alkyl group or an aralkyl group,
R_2 is a lower alkyl group, or
R_1 and R_2 together form a heterocyclic radical with the nitrogen atom;
R_3 is hydrogen, a lower alkoxy group, or a lower alkoxy group having at least one fluorine atom attached to the carbon in α-position;
R_4 is halogen or a low alkoxy group having at least one fluorine attached to the carbon in α-position; and
X is the anion of the diazonium compound;

and wherein only one of R_3 and R_4 is said fluorinated alkoxy group.

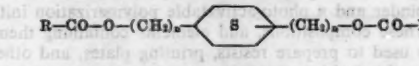
3,748,141

COUPLER DISPERSIONS UTILIZING CYCLOHEXANE-CONTAINING ESTERS AS COUPLER SOLVENTS

Albert C. Smith, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 25, 1972, Ser. No. 256,658
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 **36 Claims**

A method for incorporating one or more photographic color-forming couplers into a color photographic element or corresponding emulsion thereof by utilizing as coupler solvent a liquid ester of the formula



wherein R is individually defined at each occurrence as an alkyl group having 3–15 carbon atoms; and *n* is individually defined at each occurrence as 0–4.

3,748,142

PHOTOGRAPHIC COATINGS CONTAINING A WATER-INSOLUBLE, IONIZABLE PARTIAL SALT OF COLLAGEN

Orlando A. Battista, Fort Worth, Tex., assignor to Avicon, Inc., Fort Worth, Tex.

No Drawing. Application Apr. 27, 1970, Ser. No. 32,437, now Patent No. 3,649,347, which is a continuation of abandoned application Ser. No. 553,295, May 27, 1966, which is a continuation-in-part of abandoned application Ser. No. 436,371, Mar. 1, 1965, which in turn is a continuation of application Ser. No. 14,709, Feb. 9, 1970, now Patent No. 3,628,974. Divided and this application Oct. 15, 1971, Ser. No. 189,762
Int. Cl. G03c *1/72*
U.S. Cl. 96—114 **10 Claims**

Photographic films, plates and papers having a self-adherent coating of a water-insoluble, ionizable partial salt of collagen deposited thereon from a dispersion of the salt containing photosensitive substances. Collagen cross-linking agents may be included in the coating compositions so as to enhance the physical properties of the coatings.

3,748,143

NON-AQUEOUS EMULSIONS

Wayne A. Bowman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 1, 1972, Ser. No. 222,661
Int. Cl. G03c *1/04*
U.S. Cl. 96—114 **14 Claims**

Non-aqueous photographic silver halide emulsions are prepared by an improved process comprising:

(A) introducing the respective silver and halide reactants into an aqueous medium comprising an amphiphilic polymer which comprises units of an (N,N-dialkylamino)alkyl (alk)acrylate,
(B) coagulating the silver halide out of the liquid medium,
(C) removing the aqueous liquid and
(D) redispersing the silver halide in a water-miscible, non-aqueous medium, wherein the improvement comprises:
(E) introducing into this non-aqueous dispersion, a polymer comprising:
  (1) about 90–50% by weight of units of an alkyl (alk)acrylate,
  (2) about 10–50% by weight of units of a monomer containing at least one anionic group and
  (3) up to about 10% by weight of units of a monomer containing at least one active methylene group, in a quantity sufficient to re-coagulate the silver halide,
(F) removing the non-aqueous liquid containing residual moisture, and

(G) redispersing the silver halide in a non-aqueous medium in the presence of a polymer comprising:

(1) about 90–50% by weight of units of an alkyl (alk)acrylate,

(2) about 50–10% by weight of units of a monomer containing at least one anionic group, and

(3) up to about 10% by weight of units of a monomer containing at least one active methylene group, this polymer being present in a quantity great enough to effect the redispersion, which quantity is greater, on a molar basis, than the quantity necessary for the re-coagulation.

3,748,144

PHOTOGRAPHIC COMPOSITIONS COMPRISING LIGHT-SENSITIVE POLYMERS

John A. Ford, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Aug. 1, 1969, Ser. No. 846,958. Divided and this application Feb. 7, 1972, Ser. No. 224,307

Int. Cl. G03c *1/68, 1/70*

U.S. Cl. 96—115 R **10 Claims**

A novel class of light-sensitive polymers and their use in photographic reproduction is described which contains a 1-arylmethyleneindene group or a 5 - arylmethylene-2(5H)-furanone group attached to a polymer backbone.

3,748,145

BICYCLIC PYRAZINE COMPOSITIONS FOR FLAVORING PROCESSES

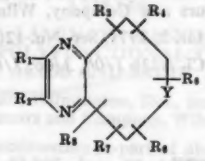
Alan O. Pittet, Atlantic Highlands, Michael E. Mason, Fair Haven, Ernst T. Theimer, Rumson, and Merrick S. Tibbetts, Colts Neck, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Original application Apr. 14, 1970, Ser. No. 28,528, now Patent No. 3,686,177. Divided and this application Sept. 9, 1971, Ser. No. 179,162

Int. Cl. A23l *1/26;* **C07d** *51/76*

U.S. Cl. 99—140 R **6 Claims**

Processes for altering the flavors of consumable products, including foodstuffs and tobaccos, which comprise adding thereto a small but effective amount of at least one bicyclic pyrazine having the formula



wherein Y is $(-CH_2-)_n$, n is an integer from 1 to 5, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are the same or different and represent hydrogen, or alkyl; the products so produced; flavoring and flavor-enhancing compositions containing such bicyclic pyrazines; and novel bicyclic pyrazines and processes for their production.

3,748,146

METHOD FOR BREAKING ANIMAL CARCASSES AND HANDLING MEAT PRODUCTS

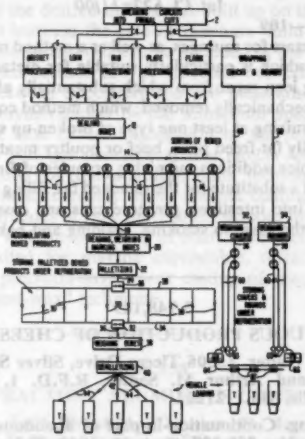
A. D. Anderson, Sioux City, Iowa, Walter E. Lauridsen, South Sioux City, Nebr., and Charles L. Overstreet, Sioux City, Iowa, assignors to Iowa Beef Processors, Inc.

Original application Feb. 19, 1968, Ser. No. 706,557. Divided and this application July 15, 1971, Ser. No. 162,868

Int. Cl. A22c *18/00*

U.S. Cl. 99—107 **1 Claim**

An integrated facility for breaking dressed animal carcasses includes a continuous flow of the carcasses and their subdivisions through a series of processing areas where the carcasses are broken into primal cuts, the primal cuts are further divided, boned and trimmed along processing lines designated for particular primal cuts, the secondary cuts thus produced are then trimmed and boned as necessary, packaged and sorted according to their weight. Groups of the secondary cuts are placed in boxes which carry machine-readable markings which indicate the box contents. The filled receptacles are carried by a common conveyor to an area where they are sorted into groups according to the machine-readable markings, palletized by groups and placed on unidirectional refrigerated storage conveyors. Orders for products are filled by discharging the pallets from their respective storage conveyors, depalletizing the goods and routing the boxes to designated transport vehicles. A constant inventory of boxed products is maintained by automatically reading the markings on the boxes and weighing the boxes both before and after they pass through the storage conveyors.



Suspended carcasses are broken into primal cuts by moving them through a series of stations where portions are removed. Large portions such as forequarters of beef are transferred to a conveyor which suspends them from a pair of tongs. Beef chucks may be supported on a looped cord which passes therethrough as they are severed from the carcass. Other portions may be removed by cutting them from the carcass and permitting them to fall at the head of a conveyor which has stations therealong for cutting, trimming, packaging and weighing meat. Tongs for suspending the meat have a pair of opposed relatively movable plates which engage opposite sides of the meat. A method and apparatus for releasing portions of meat suspended from cords which are engaged on hooks involves movement of a pair of members toward and beyond each other, whereby one member acts as an abutment to hold the hook in a desired orientation and the other member pushes the cord and the meat from the hook.

3,748,147

PROCESS FOR THE PIGMENTATION OF POULTRY

Douglas Hale and Wesu C. Ng, St. Louis, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 28,062, Apr. 13, 1970. This application Dec. 16, 1971, Ser. No. 208,981

Int. Cl. A22c *21/00;* **A23l** *1/27*

U.S. Cl. 99—107 **6 Claims**

An improved process for pigmenting poultry by a direct dyeing technique is provided for by carefully con-

trolling the temperature and time of scalding during processing of the poultry to allow the uniform application of a mixed dye solution to the surface of the processed poultry and impart a level of pigmentation which correlates to a commercially accepted scale of skin pigmentation.

3,748,148

METHOD OF PRODUCING SAUSAGE SUITABLE FOR DIETARY PURPOSES

Heinrich Jehle, Karlstrasse 41, Friedrichshafen, (Bodensee), Germany

Continuation of Ser. No. 58,998, July 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 635,651, May 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 94,600, Dec. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 523,049, Jan. 26, 1966, abandoned. This application Mar. 10, 1972, Ser. No. 234,441

Claims priority, application Germany, Feb. 2, 1965, J 27 43 653; Sept. 22, 1965, J 29 03 853; J 14 25 553

Int. Cl. A22c *11/00*

U.S. Cl. 99—109 **3 Claims**

A meat mass for sausages, as well as a method of producing the same, which is particularly suitable for dietary purposes comprising lean meat from which substantially all visible fat has been mechanically removed, which method comprises the steps of admixing at least one type of broken-up substantially mechanically fat-freed pork, beef or poultry meat with snow, water or spice additions, admixing granules of Brazil nuts to the meat as a substitute for the removed fat, filling the mixture selectively into intestines, preserve cans and casseroles, and subjecting the mass to smoking, scalding and baking respectively.

3,748,149

CONTINUOUS PRODUCTION OF CHEESE CURD

Homer E. Walter, 15508 Tierra Drive, Silver Spring, Md. 20906, and Arthur M. Sadler, R.F.D. 1, Box 439, Annapolis, Md. 21221

No Drawing. Continuation-in-part of abandoned application Ser. No. 859,007, Sept. 18, 1969. This application Feb. 14, 1972, Ser. No. 226,282

Int. Cl. A23c *19/02*

U.S. Cl. 99—116 **1 Claim**

Liquid in the form of predetermined sized particles is sprayed into a coagulating chamber in which the atmosphere is saturated with steam. The temperature in the chamber ranges gradiently from 86 to 200° F., bottom to top, and is warm enough to coagulate the sprayed particles without destroying any bacterial organisms or enzymes within the particles. The coagulated curd is collected as a thin layer of discrete, uniformly-sized, ball-shaped particles thus eliminating the step of cutting the curd to effect exudation of whey.

3,748,150

COMPOSITION CONTAINING FOOD ACID AND SUGAR AND PROCESS FOR MAKING SAME

Charles V. Fulger, Pennfield Township, Battle Creek, Mich., assignor to Kellogg Company

Filed Sept. 10, 1971, Ser. No. 179,338

Int. Cl. C13f *3/00*

U.S. Cl. 99—141 R **9 Claims**

Food acid is melted and applied in atomized form to particulate matter containing acid degradable sugar. The sugar can be in the form of agglomerates or free flowing particles. The temperature of the acid is maintained at a high enough level to evaporate any water contained therein before contact with the sugar, thereby preventing inversion of the sugar.

3,748,151

FOOD PRODUCT CONTAINING A NOVEL CONVERTING STARCH

Chester D. Szymanski, Martinsville, N.J., assignor to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Original application Oct. 14, 1969, Ser. No. 866,386, now Patent No. 3,635,741. Divided and this application Oct. 18, 1971, Ser. No. 190,412

Int. Cl. C13l *1/08*

U.S. Cl. 99—144 **6 Claims**

A novel converting starch product comprising a starch base which is admixed with a modifying agent, aqueous dispersions of which product display a high viscosity when first gelatinized but upon being cooked at retort temperatures are converted resulting in a dispersion exhibiting a substantially reduced viscosity. The modifying agent is ascorbic acid, araboascorbic acid or dihydroxymaleic acid. Such starch products find a particular use in the commercial preparation of foods.

3,748,152

TREATING OLIVES WITH CHLORINATED BRINE BEFORE FREEZING

John R. Webster, Lindsay, Calif., assignor to Consolidated Olive Growers, Lindsay, Calif.

No Drawing. Filed Oct. 19, 1971, Ser. No. 190,658

Int. Cl. A23b *7/00*

U.S. Cl. 99—156 **1 Claim**

Olives are preserved prior to freezing by storage and transport in a sanitized holding solution, such as a sanitized brine. The brine is discarded at the time the olives are frozen.

3,748,153

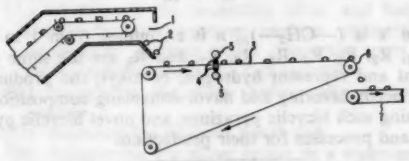
SURFACE TREATMENT OF FRIED FROZEN FOOD WITH SUPERHEATED STEAM

Paul Sanford Hebert, Wilmington, Del., and Michael Hillas Shearon, Glen Farms, Md., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1971, Ser. No. 120,249

Int. Cl. A23b *1/06, 3/06, 7/00*

U.S. Cl. 99—193 **4 Claims**



Process of exposing foods frozen by contact with ebullient fluorohalocarbons, whose surfaces comprise maldistributed congealed oils or fats, to superheated steam for from about 0.1 second to about 1 second, which transiently melts and mobilizes said oils or fats thus correcting said maldistribution and restoring the prefreezing appearance of the food, without raising the equilibrium bulk temperature of the food to the freezing transistion nor adding more than about 0.6 wt. percent condensed water to the food nor producing a visible water glaze on the food.

3,748,154

INTUMESCENT COATING COMPOSITION COMPRISING AROMATIC SULFONAMIDES

John J. Seipel, Ambler, Pa., and Shirley H. Roth, Highland Park, and Joseph Green, East Brunswick, N.J., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed Jan. 11, 1972, Ser. No. 216,983

Int. Cl. C09d *5/14, 5/16;* C09k *3/28*

U.S. Cl. 106—15 FP 6 Claims

A binder showing thermal change at a suitable temperature is used to dissolve or disperse an aromatic sulfonamide intumescent agent bearing a nuclear substituent which is linked to the aromatic ring through a nitrogen atom. Among the preferred binders are suitable vinyl chloride/vinylidene chloride and vinyl chloride/vinyl acetate copolymers, chlorinated rubber, and chlorinated or chlorosulfonated polyethylenes. The preferred intumescent agents are p-aminobenzene sulfonamide and p-acetamidobenzenesulfonamide.

3,748,155

METHOD OF MAKING INVESTMENT MOLDS FROM IMPROVED PATTERN MATERIAL

Fred B. Speyer, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 98,099, Dec. 14, 1970. This application May 15, 1972, Ser. No. 253,188

Int. Cl. B28b *7/34*

U.S. Cl. 106—38.2 5 Claims

Method of making investment molds wherein an improved pattern material is employed, the pattern material containing a waxy solid and up to 50% by weight of ethyl cellulose, the pattern material having a relatively low softening point and very low viscosity in the fluid state at a temperature at which it is injected into the pattern die.

3,748,156

REFRACTORY LAMINATE BASED ON POSITIVE SOLS AND POLYFUNCTIONAL ORGANIC AND INORGANIC ACIDS AND SALTS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,907, June 25, 1970. This application June 1, 1971, Ser. No. 148,966

Int. Cl. C04b *35/14*

U.S. Cl. 106—38.3 12 Claims

A rapid process for forming a refractory laminate on the surface of a support structure which comprises dipping the structure into a bath comprising a sol of positively charged colloidal particles of an inorganic substance to form a coating on the surface, contacting the coated surface with a solution or dispersion of a polyfunctional organic or inorganic acid or salt to firmly set the coating, and removing excess setting agent solution or dispersion from the coated surface. This procedure is repeated until a laminate of the desired thickness is built up on the surface. This technique makes it possible to successively apply and set coatings in very short times without intermediate drying and without sloughing of coats. The process is particularly suited for making expendable refractory shell molds for precision investment casting of metals by the so-called "lost-wax" technique.

3,748,157

REFRACTORY LAMINATE BASED ON NEGATIVE SOLS OR SILICATES AND BASIC ALUMINUM SALTS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,910, June 25, 1970. This application June 1, 1971, Ser. No. 148,965

Int. Cl. C04b *35/14*

U.S. Cl. 106—38.35 12 Claims

A rapid process for forming a refractory laminate on the surface of a support structure which comprises dipping the structure in a bath comprising a sol of negatively charged colloidal particles of an inorganic substance and/or a solution of an alkaline ionic silicate to form a coating on the surface, and contacting the coated surface with a basic aluminum salt setting agent to firmly set the colloidal silica or silicate. This procedure is repeated until a laminate of the desired thickness is built up on the surface. In order to increase the rate of laminate build-up particulate refractory material can be included in the bath and/or the coated surface can be stuccoed between dips. Interaction between oppositely charged materials combined with the polymerization of the aluminum species in the presence of base causes aggregation of the particles and produces a stiff gel structure. These effects result in the immobilization of the coatings. This technique makes it possible to successively apply and set coatings to build ceramic laminates in very short times without intermediate drying and without sloughing of coats. The process is particularly suited for making expendable, refractory shell molds for precision investment casting of metals by the so-called "lost-wax" technique.

3,748,158

REFRACTORY ALUMINOUS CEMENTS

Alexandru Iosif Braniski, Theodor D. Ionescu, and Nicoalae D. Deica, Bucharest, Rumania, assignors to Institutul de Cercetari Metalurgice, Bucharest, Rumania

No Drawing. Continuation-in-part of applications Ser. No. 24,029, Mar. 30, 1970, and Ser. No. 168,431, Aug. 2, 1971, which is a continuation of application Ser. No. 706,764, Feb. 20, 1968. This application Oct. 28, 1971, Ser. No. 193,581

Claims priority, application Rumania, July 3, 1967, 54,197; May 27, 1969, 60,093

The portion of the term of the patent subsequent to Feb. 27, 1990, has been disclaimed

Int. Cl. C04b *35/24, 35/44*

U.S. Cl. 106—62 7 Claims

A refractory aluminous cement containing 75 to 40% by weight calcium monoaluminate and/or calcium dialuminate and 20 to 55% by weight of spinel

$(MgO \cdot Al_2O_3)$

3,748,159

HIGH TEMPERATURE CEMENTING COMPOSITIONS CONTAINING A LIGNOSULFONIC ACID SALT AND A PENTABORIC ACID SALT

Charles R. George, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

No Drawing. Filed Apr. 20, 1972, Ser. No. 245,996

Int. Cl. C04b *7/02, 13/00*

U.S. Cl. 106—90 20 Claims

This specification discloses additives for retarding the setting time of cement compositions at high temperatures

which are basically comprised of mixtures of a lignosulfonic acid salt and a pentaboric acid salt, novel cement compositions containing the additives and methods of cementing high temperature well formations employing the cement compositions.

3,748,160
PROCESS FOR MAKING MOLDABLE BAGASSE COMPOSITIONS
Manuel Carbajal, Entre Rios 54, Tucuman, Argentina
No Drawing. Filed Apr. 13, 1971, Ser. No. 133,752
Claims priority, application Argentina, June 9, 1970, 229,221
Int. Cl. C04b *7/02*
U.S. Cl. 106—99 **5 Claims**

Process for making from by-product sugar cane bagasse a plastic mass which can be molded into building wallboard comprising treating ground bagasse with salts to convert residual sugar juices to inert compounds, and mixing the thus treated bagasse with from 10–15% by weight of portland cement which fills the vasculae of the bagasse stalks and binds the fibers thereof into a unitary mass. Wall board molded from the mass is light, strong, water- and fireproof and will adhere to conventional building coatings such as plaster, paint, mortar, plastic or paper sheets.

3,748,161
COMBUSTIBLE WATER REPELLENT COATING
William O. Seals, Budd Lake, and Jean Picard, Morristown, N.J., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Mar. 2, 1971, Ser. No. 120,354
Int. Cl. C08b *21/12, 27/22, 27/02*
U.S. Cl. 106—181 **10 Claims**

A composition suitable for use as a repellant coating for a non-metallic combustible cartridge case and the like against the effects of water in both the liquid and vapor state. The composition represents a synergistic combination of a wax dispersed in a hydrous aluminum silicate gel and having a plasticized nitrocellulose binder. The properties of the above composition relative to abrasion and adhesion may be further enhanced with 2,4-tolylene diisocyanate and aluminum of the flake variety.

3,748,162
LIGHT STABLE QUINACRIDONEQUINONE YELLOW PIGMENT
William A. West, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Mar. 19, 1971, Ser. No. 126,375
The portion of the term of the patent subsequent to Aug. 22, 1989, has been disclaimed
Int. Cl. C08h *17/14*
U.S. Cl. 106—288 Q **1 Claim**

Quinacridonequinone is rendered lightfast by the provision of a solid solution thereof with essentially colorless 6,13-dihydroquinacridone.

3,748,163
PIGMENT COMPOSITIONS AND METHODS THEREFOR
Thomas D. Mutaffis, North Plainfield, and Melvin G. Schnieder, Roselle, N.J., and John Gaczi, Staten Island, N.Y., assignors to GAF Corporation, New York, N.Y.
No Drawing. Filed Apr. 21, 1971, Ser. No. 136,233
Int. Cl. C09c
U.S. Cl. 106—288 Q **19 Claims**

Organic pigment compositions are provided exhibiting improved dispersibility in a wide variety of vehicle systems comprising an organic pigment such as a metal tetrazaporphine, carbazole or diazine pigment intimately admixed with a metal salt of naphthenic acid or octanoic acid, the metal being either zirconium, barium, iron, zinc, calcium, antimony, lithium or strontium.

Methods are also provided for contacting a dispersion of the organic pigment with the metal salt and subjecting the resulting mixture to agitation to obtain a low viscosity, high pigment ratio dispersion.

3,748,164
NOVEL PIGMENTATION METHOD FOR ORGANIC PIGMENTS
Takashi Akamatsu, Ashiya, and Yukio Kuwahara, Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
No Drawing. Filed June 17, 1971, Ser. No. 154,175
Claims priority, application Japan, June 23, 1970, 45/55,446; July 27, 1970, 45/65,959
Int. Cl. C09c
U.S. Cl. 106—288 Q **16 Claims**

A method for producing a pigment by conditioning a crude organic pigment, which comprises grinding a mixture of a crude organic pigment and an aminoplast as a tackifying agent in the presence of an inorganic or organic salt as a grinding agent in a double-arm dispersion mixer, in the absence or presence of at least one additive selected from the group consisting of water, alcohols, aliphatic hydrocarbons, aliphatic halohydrocarbons, aromatic hydrocarbons, aromatic halohydrocarbons, surface active agents and solid resins.

3,748,165
NICKEL-COBALT ALUMINATE PIGMENTS
Brian Hill, Ramsey, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed Jan. 26, 1972, Ser. No. 221,073
Int. Cl. C09c *1/36*
U.S. Cl. 106—300 **3 Claims**

An improved inorganic, blue pigment of spinel structure which comprises a solid solution of about 15 to about 50 mole percent of nickel aluminate in cobalt aluminate. The improved pigment retains a greater degree of blueness when diluted 1 to 10 with titanium dioxide pigment than either cobalt aluminate pigment or nickel aluminate pigment.

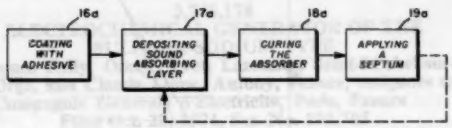
3,748,166
ELECTROLESS PLATING PROCESS EMPLOYING SOLUTIONS STABILIZED WITH SULFAMIC ACID AND SALTS THEREOF
Leon A. Kadison and Eileen Maguire, Pasadena, Calif., assignors to Crown City Plating Company, El Monte, Calif.
No Drawing. Continuation-in-part of application Ser. No. 118,480, Feb. 24, 1971. This application Sept. 6, 1972, Ser. No. 286,838
Int. Cl. C23c *3/02*
U.S. Cl. 117—47 A **6 Claims**

A process in which sulfamic acid and its salts are used to stabilize alkaline electroless copper plating solutions against decomposition. When employed in the second bath of a two-bath electroless plating system, the presence of sulfamic acid and its salts permits rapid deposition, over a broad range of concentrations, of copper onto an initial copper or nickel plate, while preventing deposition of copper onto a noble metal catalyzed surface. The stabilizers also serve to supplement single-bath electroless copper plating processes.

3,748,167
METHOD FOR APPLYING AN ACOUSTIC BARRIER
Meyer Lepor, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Aug. 9, 1971, Ser. No. 169,955
Int. Cl. E04b *1/82*; G10k *11/04*
U.S. Cl. 117—72 **1 Claim**

An acoustic barrier is coated on one side of a wall to effectively attenuate and reflect acoustic energy im-

pinging the wall's opposite side. Spraying or brushing on a layer of a semiliquid sound absorbing material and covering the sound absorbing material after it has solidified with a sprayed-on adhesive resin septum allows a complete continuous covering of a wall surface irrespective of its configuration. Thusly, rigid mounting devices which otherwise act as sound conduits are eliminated and by applying successive layers of the sound absorbing material and septums, a highly effective acoustic barrier is fabricated at minimal cost.



3,748,168

FISHING LINE WITH A CYCLIC SULFONIUM ZWITTERION-FLUOROCARBON COATING

Donald L. Schmidt and Hugh B. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,895
Int. Cl. A01k *91/00*
U.S. Cl. 117—72 **7 Claims**

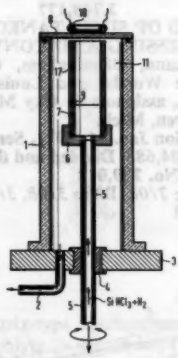
Fishing line with a surface coating of a polymer of a water-soluble cyclic sulfonium phenoxide zwitterion (I) containing essentially uniformly dispersed colloidal particles of a fluorocarbon resin has superior handling characteristics and feel coupled with improved resistance to water, solvents, wear and algae pickup.

3,748,169

METHOD AND APPARATUS FOR THE PRODUCTION OF HOLLOW MEMBERS OF ANY LENGTH OF SEMICONDUCTOR MATERIAL

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft

Filed Mar. 15, 1972, Ser. No. 234,975
Claims priority, application Germany, Apr. 14, 1971, P 21 17 933.9
Int. Cl. C23c *11/00, 11/06*
U.S. Cl. 117—106 A **16 Claims**



A method for the production of hollow members of semiconductor material of any length by thermal decomposition of a gaseous compound containing semiconductor material is described. Preferably, a hollow member of graphite or silicon is employed as a carrier on the frontal surface of which semiconductor material is deposited in response to the creation of a temperature gradient along the carrier member. The hollow member is moved out of the depositing zone at the rate of deposition of the semiconductor material.

3,748,170

METHOD OF COATING METAL

Harold J. Michael, Columbus, Ohio, assignor to North American Rockwell Corporation

No Drawing. Original application Sept. 4, 1970, Ser. No. 69,914, now Patent No. 3,706,579. Divided and this application Sept. 1, 1971, Ser. No. 177,142
Int. Cl. B32b *15/00*
U.S. Cl. 117—129 **2 Claims**

A method of providing novel protective coating for metals by firing in an oxidizing environment at a temperature in the general range of 1250° F. to 1600° F., said coating essentially consisting of aluminum, a special mill addition having both refractory compound and reducible compound constituents, and a special homogeneous frit; thus obtaining improved resistance of the metals to weathering and to cororsion by alkaline or acid solution attack under atmospheric conditions.

3,748,171

PROCESS FOR GENERATING VESICULAR MATERIAL HAVING POROUS, SORPTIVE SURFACE STRUCTURE WITH METALLURGICAL SILICON ADDITION

John E. Peeling, Jr., Reisterstown, Md., assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed May 21, 1971, Ser. No. 145,911
Int. Cl. C03c *5/00, 5/02;* C23d *5/00*
U.S. Cl. 117—129 **7 Claims**

ABSTRACT OF THE DISCLOSURE

In the formation of vesicular, matte or semi-matte ceramic material useful for imparting continuous cleaning properties to a food cooking oven wherein an admixture comprising frit-containing enameling composition and particulate elemental aluminum is fired, replacing at least a portion of said aluminum with a particulate metallurgical silicon improves color stability of said ceramic material.

3,748,172

MAGNESIUM-BASED COATING FOR THE SACRIFICIAL PROTECTION OF METALS

Kenneth K. Speirs, Universal City, and Martin Weinstein and Roy L. Blize, San Antonio, Tex., assignors to The Chromalloy American Corporation

No Drawing. Filed May 17, 1971, Ser. No. 144,225
Int. Cl. C23f *7/00, 17/00;* C23c *9/02*
U.S. Cl. 117—135.1 **6 Claims**

A method is provided for improving the corrosion resistance of material substrates. The method is particularly applicable to the protection of metal substrates, such as ferrous metal articles, among other metals, and, in particular, to the protection of low alloy steel gas turbine engine components for aircraft in which the surface is provided with an adherent protective layer of a sacrificial coating rich in magnesium and also containing silicon, oxygen and optionally iron. The coating is characterized by the presence of magnesium silicide as a major active constituent.

3,748,173

INTUMESCENT COATED ARTICLES

Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,229
Int. Cl. C09d *5/18;* C09k *3/28*
U.S. Cl. 117—136 **9 Claims**

Articles coated with intumescent compositions which comprise certain bis(aromatic sulfonamides) wherein the

aromatic rings are linked by a divalent functional group, such as an oxy, thio, sulfinyl, sulfonyl, imino, ureido, thioureido, guanido, carbonate, phosphate, or alkylene group. The intumescent agents may be prepared by conventional techniques and may be employed in conjunction with conventional additives. Preferred intumescent agents are those in which two benzenesulfonamide groups are linked by an oxy, ureido, sulfonyl, or imino group.

3,748,174

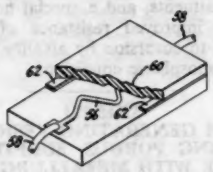
THIN FILM NICKEL TEMPERATURE SENSOR

Arthur C. M. Chen and James M. Lommel, Schenectady, N.Y., assignors to General Electric Company

Original application Dec. 30, 1968, Ser. No. 787,685, now Patent No. 3,660,158. Divided and this application Aug. 6, 1971, Ser. No. 169,850

Int. Cl. H01c 7/02; G01k 7/22

U.S. Cl. 117—217 **3 Claims**



Thin film nickel temperature sensors having a temperature coefficient of resistance of above +0.2%/° C. and a resistance above 0.35 ohm per square are formed by electron beam evaporation of a high purity nickel source at pressures below 8×10^{-6} torr and deposition of the evaporated nickel atop a dielectric substrate, e.g. a polyimide film, heated above 60° C. The nickel film preferably is deposited to a thickness between 250 A. and 3000 A. and masking is employed to produce a desired configuration in the deposited nickel film. To stabilize the resistance of the deposited nickel film, a dielectric encapsulant such as alumina, silica, a polyimide or a fluorocarbon then is overlayed upon the film by conventional vacuum deposition or bonding techniques.

3,748,175

PROCESS FOR PREPARING CRYSTALLINE, ANHYDROUS BETA-DEXTROSE

Tamotsu Kawamura, Tokyo, Kazuo Yamashita, Yokkaichi, and Keisuke Hattori and Yoshinao Ito, Mie, Japan, assignors to Tokai Togyo Co., Ltd., Yokkaichi-shi, Mieken, Japan

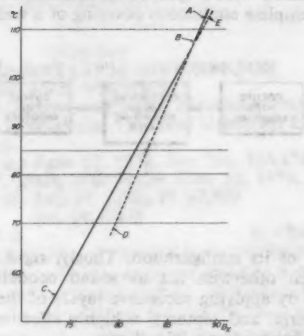
Continuation of abandoned application Ser. No. 811,426, Mar. 28, 1969. This application July 6, 1971, Ser. No. 160,122

Claims priority, application Japan, Apr. 6, 1969, 44/22,378

Int. Cl. C13k 1/10

U.S. Cl. 127—60 **2 Claims**

Crystalline, anhydrous beta-dextrose is prepared by concentrating an aqueous solution containing dextrose under under a reduced pressure to a concentration of Brix 88° to 91°, seeding the concentrated solution with crystalline, anhydrous beta-dextrose as seed crystals at a seeding temperature ranging 85° to 110° C. according to a shock seeding method or 80° to 110° C. according to a full seeding method, and subsequently boiling the resulting massecuite at a massecuite temperature ranging from 70° to 110° C. Likewise, a mixture of crystalline, anhydrous beta-dextrose and crystalline, anhydrous alpha-dextrose at a desired mixing ratio is prepared by concentrating an aqueous solution containing dextrose to a concentration of Brix 88° to 91° under a reduced pressure, seeding the concentrated solution with a mixture of crystalline, anhydrous beta- and alpha-dextroses at a desired mixing ratio as seed crystals at a seeding temperature ranging from



85° to 110° C. and subsequently boiling the resulting massecuite at a massecuite temperature of 85° to 110° C.

3,748,176

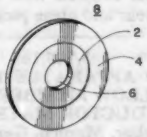
THERMO-RECLAIMING PROCESS OF ALUMINUM SUBSTRATES FOR DISKS

John Gagliani, San Diego, Calif., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sept. 3, 1971, Ser. No. 177,802

Int. Cl. B23p 7/00

U.S. Cl. 134—2 **22 Claims**



Method of reclaiming magnetically unusable disks by thermodegrading the organic components of the magnetic coating to remove the coating while leaving the substrate mechanically free of imperfections.

3,748,177

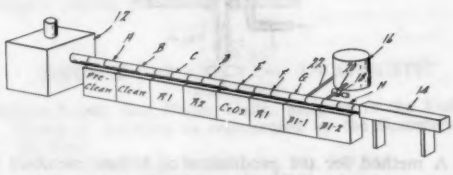
METHOD OF SIMULTANEOUS FLUID PROCESSING AND CONVEYING

John W. Neumann, Birmingham, Chester G. Clark, Grosse Pointe Woods, and Louis J. Minbiole, Jr., Detroit, Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Original application Jan. 11, 1971, Ser. No. 105,368, now Patent No. 3,704,685. Divided and this application Mar. 29, 1972, Ser. No. 239,012

Int. Cl. B05c 3/08; B08b 3/08, 3/10; B67c 1/00

U.S. Cl. 134—30 **9 Claims**



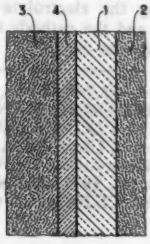
An apparatus and method for processing elongated cup-shaped workpieces through one or a plurality of modular

processing units, each of which incorporates a plurality of fluid streams oriented to impinge against the surfaces of the workpieces, thereby effecting a conveyance of the workpieces through the apparatus and a concurrent treatment of the interior and exterior surfaces thereof.

3,748,178
ELECTROCHEMICAL GENERATOR OF THE SULPHUR-SODIUM TYPE

Jacques Fally, Orsay, Yvon Lazennec, Saint-Michel-sur-Orge, and Claude Lasne, Antony, France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Oct. 22, 1971, Ser. No. 191,705
Claims priority, application France, Oct. 30, 1971, 7039319
Int. Cl. H01m
U.S. Cl. 136—6 F **12 Claims**

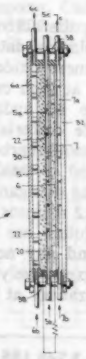


A highly porous, thin layer of electrically insulative material separates the positive active material impregnated electronic conductive material from the solid electrolyte in a rechargeable electrochemical generator of the sulphur-sodium type.

3,748,179
MATRIX-TYPE FUEL CELL WITH CIRCULATED ELECTROLYTE

Calvin L. Bushnell, South Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 16, 1971, Ser. No. 124,863
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 R **9 Claims**

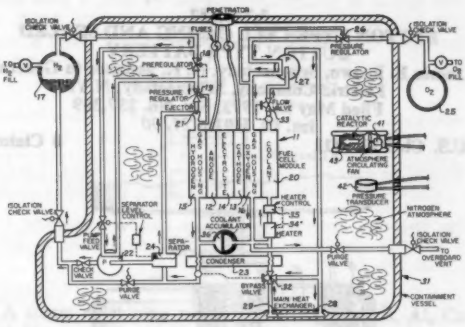


A compact, matrix-type electrochemical cell utilizing a circulating electrolyte is described. The cell comprises an anode, a cathode, a matrix containing an ion-conductive electrolyte between the anode and cathode, and a porous metal plate containing porous pins positioned adjacent to one of said anode and cathode in order that the pins of the plate are in contact with the anode or cathode over the limited surface area of the pins. Electrolyte circulated behind the porous plate floods the porous plate, porous pins, and electrode directly beneath the pins and makes contact with the electrolyte contained in the electrolyte matrix. As a result of the plurality of contact points, electrolyte is circulated into and from the matrix. The advantages of both a circulating electrolyte system and a matrix-type electrolyte system are realized.

3,748,180
FUEL CELL SYSTEM FOR UNDERWATER VEHICLE

Joseph V. Clausi, Portland, Michael B. Landau, Hartford, and George Vartanian, Rockville, Conn., assignors to the United States of America as represented by the Secretary of the Navy

Filed Mar. 30, 1972, Ser. No. 239,609
Int. Cl. H01m *27/00, 27/12*
U.S. Cl. 136—86 B **5 Claims**

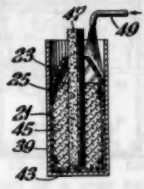


A fuel cell system for an underwater vehicle having at least one fuel cell module for supplying electrical power for said vehicle. A first tank containing hydrogen is connected to one reactant chamber of a fuel cell module and a second tank containing oxygen is connected to another reactant chamber of the fuel cell module. The hydrogen-product water output from the hydrogen reactant chamber is condensed and separated and the water produced is stored in the first tank containing hydrogen. The fuel cell module is placed in a containment vessel which is pressurized with nitrogen. A catalytic reactor is provided in the containment vessel to form water in the event that there are simultaneous leaks in both the hydrogen and oxygen high pressure supply lines. A pressure transducer is also provided in the containment vessel for shutting down the system if there is a high pressure leak in either the hydrogen or oxygen line.

3,748,181
GALVANIC CELL HAVING IMPROVED CONSTRUCTION

Vicente S. Alberto, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed July 21, 1971, Ser. No. 164,518
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 **7 Claims**



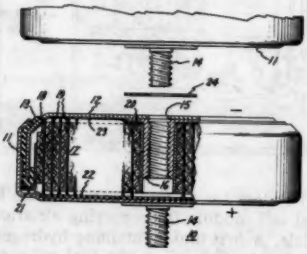
A galvanic cell is disclosed. The cell comprises a metal can having a wall with an inner surface, a top, and a

bottom, depolarizing mix partially filling said can such that there is a space between the top of the mix and the top of the can, a current collecting rod in said depolarizing mix in contact therewith and extending outwardly therefrom to at least the top of said can, a paper liner separating said depolarizing mix from said can, and a strip of plastic film attached to the top of said paper liner, the film being shrunk away from the inner surface of the wall of the can. In the preparation of the cell, the strip of plastic film that is attached to the top of the paper liner acts as a shield or apron to protect the can from being smeared with depolarizing mix as the mix is being inserted in the can. The plastic film is then heat shrunk away from the inner surface of the wall of the can. The galvanic cell of the invention has reduced tendency to lose moisture from the depolarizing mix and from the separator.

3,748,182
BUTTON TYPE CELL CASING AND SEALED BUTTON TYPE BATTERY

James E. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 26, 1972, Ser. No. 257,309
Int. Cl. H01m *21/00*
U.S. Cl. 136—111 **8 Claims**

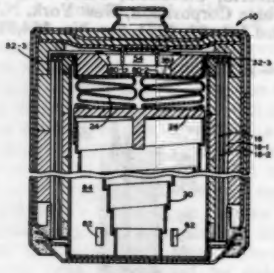


A cell casing for a primary dry cell battery of the button type is disclosed which includes a case with a first elongated electrically conductive member affixed centrally to its exterior surface, and a cover with a second elongated electrically conductive hollow member affixed centrally to its interior surface in communication with an aperture. Both a single and a multi-cell battery are described which include the above battery casing.

3,748,183
RESERVE ELECTRIC CELL

John Zaleski, Pleasantville, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 17, 1972, Ser. No. 244,617
Int. Cl. H01m *21/10*
U.S. Cl. 136—114 **10 Claims**



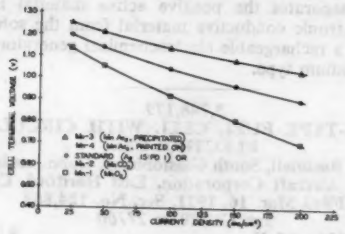
A reserve type cell with a charged volume of electrolyte held confined in a closed cylindrical vial of rubber or rubber-like material, with means for puncturing a front top end wall of the rubber cylinder to permit the electrolyte to move out; and with a back-end pressure plate pressed by a compressed energy-storing spring that is restrained by the hydrostatic pressure of the full cylinder of electrolyte until the cylinder is punctured to release the electrolyte when cell activation is desired, whereupon the reaction pressure of the vial on the spring is relieved and the spring is able to compress the rubber vial to press the electrolyte out of the vial and into the operating cell space between the anode and the cathode.

This invention relates to a reserve cell that is normally kept and stored in unactivated condition, by keeping the electrolyte isolated and separated from the anode and the cathode until there is a desire for its utilization, at which time the cell is then put into activated condition by releasing the electrolyte from its isolated condition and location, usually in a separate closed container, and then permitting the electrolyte to enter the space between the anode and the cathode to serve as an active electrolyte to activate the cell.

3,748,184
PROCESS OF PREPARING MANGANESE OXIDE CATALYZED CATHODES

Romeo R. Witherspoon, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1971, Ser. No. 202,412
Int. Cl. H01m *13/04*
U.S. Cl. 136—122 **7 Claims**



Method of rendering the active layer of an alkaline-electrolyte, oxygen-depolarized cathode catalytically active with a low cost manganese oxide catalyst. The cathode is capable of operating at high current densities without an appreciable buildup of hydrogen peroxide in the electrolyte. The cathode materials are treated with an alcohol-solvated manganous carboxylate solution in the presence of oxygen and a weak non-metal-containing alkalizer thereby forming manganic oxide having particle sizes mostly less than 0.2 microns in diameter. The active layer materials and solution are subsequently heated to drive off the solvent and any non-manganese oxide reaction products. An inexpensively catalyzed cathode with a low cathodic polarization at high current densities results.

3,748,185
RETRACTABLE AND VENTILATED BATTERY HOLDER WITH SPECIAL SWITCHING SYSTEM

John Cooper, 13 Mohawk St.; and George Stubbert, 198 Catharine Ave., both of Brantford, Ontario, Canada; and William Shepperd, 4 Chestnut St. E., St. Catharines, Ontario, Canada

Filed Mar. 16, 1971, Ser. No. 124,742
Int. Cl. H01m *1/04*
U.S. Cl. 136—173 **2 Claims**

A retractable and ventilated battery holder using special contact rings for insertion between the batteries

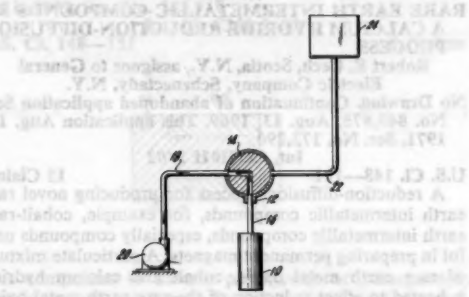
which, by the manual operation of an end stud, permits the power to be turned on or off and the batteries to be isolated when idle.

3,748,186

METHOD FOR FILLING SEALED BATTERIES

Martin G. Rosansky, Monsey, and Bruce E. Jagid, Whitestone, N.Y., assignors to Power Conversion, Inc., Mount Vernon, N.Y.

Filed Dec. 2, 1971, Ser. No. 203,976
Int. Cl. H01m *31/00*
U.S. Cl. 136—175 5 Claims



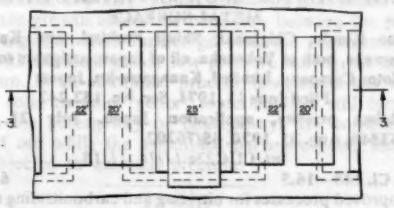
A dry gas that does not react with other components of the finished battery is introduced into a battery casing by assembling the casing in a dry gas atmosphere. The casing is partially evacuated, and a liquid electrolyte that expands substantially when heated is introduced. The casing is then sealed in a gas tight manner. The residual dry gas, which preferably is dry air, is compressed when the temperature rises permitting the electrolyte to expand without leaking from the casing.

3,748,187

SELF-REGISTERED DOPED LAYER FOR PREVENTING FIELD INVERSION IN MIS CIRCUITS

Kenneth G. Aubuchon and Hans G. Dill, Costa Mesa, and Robert W. Bower, Palos Verdes, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 3, 1971, Ser. No. 168,713
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 10 Claims



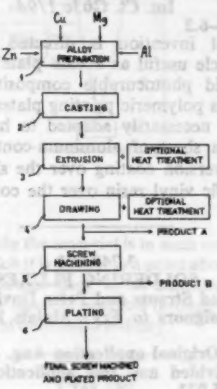
Field inversion or "channeling" between adjacent MIS devices in a common substrate is inhibited by forming a recessed insulating region between the devices and by forming a heavily doped channel-stopping layer under the insulating layer. The insulating layer extends into the substrate to a greater depth than do the diffusions of the adjacent MIS devices and it extends laterally beyond the edges of the channel-stopping layer under it. As a result the channel-stopping layer is safely spaced from both of the adjacent diffusions.

3,748,188

SCREW MACHINING MATERIAL AND METHOD OF PREPARING SAME

Edouard Gervais, Montreal, Pierre Chollet, Pierrefonds, and Robert Ranger, Ile Perrot, Quebec, Canada, assignors to Noranda Mines Limited, Toronto, Ontario, Canada

Filed Dec. 7, 1971, Ser. No. 205,581
Claims priority, application Canada, Nov. 1, 1971, 126,610
Int. Cl. B22d *25/00*
U.S. Cl. 148—2 17 Claims



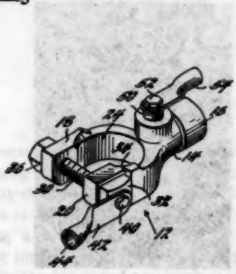
A screw machining material consisting of Zn, Al, Cu and Mg is produced by alloying these elements in predetermined proportions, then continuously or semi-continuously casting the alloy into billets while offsetting its cracking tendency, then extruding such billets into rods, and finally drawing the obtained rods up to the final screw machining size. Such material can optionally be heat treated to improve its dimensional stability. The articles screw machined from this material may be suitably plated resulting in an excellent final product.

3,748,189

ELECTRICAL CONNECTOR AND METHOD OF MAKING SAME

Clarence B. Haegert, 1211 Elm St., Coffeyville, Kans.

Application Feb. 27, 1970, Ser. No. 15,267, now Patent No. 3,656,094, which is a continuation-in-part of application Ser. No. 610,878, Jan. 23, 1967. Divided and this application Jan. 31, 1972, Ser. No. 222,222
Int. Cl. B22d *25/02, 17/00*
U.S. Cl. 148—3 3 Claims



An electrical connector includes a body means having means for securing an electrical member thereto. The body means is formed of a zinc base alloy comprising aluminum, copper, cadmium, tin, lead, magnesium, iron and zinc within certain critical ranges. The zinc alloy is heated to a molten state and the molten alloy is then

pressure or gravity molded, subjected to fast chilling and chemically treated to form an electrical connector free from corrosion.

3,748,190
LAMINATED ALUMINUM ARTICLE AND METHOD

Charles H. Weber III, Silver Spring, and John E. Pickard, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 13, 1971, Ser. No. 143,174
Int. Cl. G03c *1/94*
U.S. Cl. 148—6.2 **5 Claims**

The present invention is directed to a composite laminated article useful as a base plate for supporting a layer of liquid photocurable composition from which articles such as polymeric printing plates may be formed. The article is necessarily adapted to have a gold color and includes a sheet of aluminum-containing metal, an inorganic conversion coating over the sheet, and a coating of a specific vinyl resin over the conversion coat.

3,748,191
SOLDERING FLUXES

Rudolf Siegfried Strauss and Peter David Teitz, London, England, assignors to Fry's Metals Limited, London, England

No Drawing. Original application Aug. 8, 1969, Ser. No. 848,701. Divided and this application Jan. 6, 1972, Ser. No. 215,931
Int. Cl. B23k *35/34*; C07c *143/00*
U.S. Cl. 148—23 **15 Claims**

A method of soldering or tinning in which the flux used consists of or contains a hydrohalide, other than a hydroiodide, of a monobasic amino acid or of an ester of such acid with an alcohol containing 1 to 10 carbon atoms.

3,748,192
NICKEL BASE ALLOY

William J. Boesch, Utica, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Continuation-in-part of application Ser. No. 42,412, June 1, 1970. This application Feb. 1, 1972, Ser. No. 222,504
The portion of the term of the patent subsequent to Apr. 4, 1989, has been disclaimed
Int. Cl. C22c *19/00*
U.S. Cl. 148—32.5 **10 Claims**

A nickel base alloy consisting essentially of, in weight percent, up to 0.18% carbon, from 14.2 to 20% cobalt, from 13.7 to 16% chromium, from 3.8 to 5.5% molybdenum, from 2.75 to 3.75% titanium, from 3.75 to 4.75% aluminum, up to 4% iron, from 0.005 to 0.035% boron, up to 0.5% zirconium, up to 0.5% hafnium, up to 0.75% columbium, up to 0.5% rhenium, up to 0.75% tantalum, up to 1.0% manganese, up to 3.0% tungsten, up to 0.5% rare earth metals, balance essentially nickel with incidental impurities, and having an average grain size coarser than ASTM No. 4 and a morphology comprised of gamma prime particles which consist essentially of randomly dispersed irregularly shaped particles less than about 0.35 micron in diameter.

3,748,193
RARE EARTH INTERMETALLIC COMPOUNDS BY A CALCIUM HYDRIDE REDUCTION-DIFFUSION PROCESS

Robert E. Cech, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 849,875, Aug. 13, 1969. This application Aug. 16, 1971, Ser. No. 172,290
Int. Cl. H01f *1/02*
U.S. Cl. 148—101 **11 Claims**

A reduction-diffusion process for producing novel rare earth intermetallic compounds, for example, cobalt-rare earth intermetallic compounds, especially compounds useful in preparing permanent magnets. A particulate mixture of rare earth metal oxide, cobalt and calcium hydride is heated to effect reduction of the rare earth metal oxide and to diffuse the resulting rare earth metal into the cobalt to form the intermetallic compound.

3,748,194
PROCESSING FOR THE HIGH STRENGTH ALPHA-BETA TITANIUM ALLOYS

Duane L. Ruckle, Enfield, Robert A. Sprague, Kensington, and Michael P. Smith, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

No Drawing. Filed Oct. 6, 1971, Ser. No. 187,037
Int. Cl. C22c *15/00*; C22f *1/18*
U.S. Cl. 148—12.7 **4 Claims**

A process for improving the toughness and property uniformity of the high strength alpha-beta titanium forged alloys by a specific heat treatment schedule which includes a short isothermal transformation heat treatment step low in the alpha-beta region subsequent to solutioning treatment high in the alpha-beta region.

3,748,195
METHOD FOR FORMING A SOFT NITRIDE LAYER IN A METAL SURFACE

Takao Kondo, Chigasaki; Shinji Fushimi, and Kunitsugu Kawabe, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Japan

Filed June 11, 1971, Ser. No. 152,242
Claims priority, application Japan, July 21, 1970, 45/63848; Aug. 31, 1970, 45/76202
Int. Cl. C23c *11/16, 11/18*
U.S. Cl. 148—16.5 **6 Claims**

Improved processes for nitriding and carbonitriding steel alloys by the use of gas mixtures containing a small amount of air or oxygen. In the case of nitriding, a metal specimen is held in an atmosphere of ammonia gas to which is added 0.5 to 5 percent air by volume or 0.1 to 1 percent oxygen by volume at temperatures between 450° and 650°C. As a result of the treatment, a soft nitride layer is formed in the surface of the specimen. When carbonitriding is performed, a gas mixture containing 30 percent ammonia gas, 30 percent carbon monoxide, 5 to 10 percent air or 1 to 2 percent oxygen and the remaining volume percentage nitrogen, is employed. In this case, also a soft nitride layer substantially free from Fe_2N is

formed in the metal surface. According to this invention, the time required to perform a desired nitriding or carbonitriding is greatly reduced, while the wear resistance, fatigue resistance and toughness of the metal are highly improved.

3,748,196

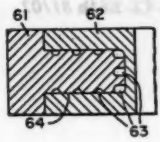
METHOD OF UTILIZING HEAT AND PRESSURE TO CURE FLAWS IN METAL PIECES

George A. Kemeny, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application May 20, 1968, Ser. No. 730,424, now Patent No. 3,601,884. Divided and this application May 21, 1971, Ser. No. 145,917

Int. Cl. C22f 3/00

U.S. Cl. 148—131 6 Claims



A component to have a passageway or passageways therein, for example for the flow of cooling fluid, is formed in two or more parts which fit closely together so that one surface of one part is adjacent a surface of the other part. At least one of the mating surfaces has grooves or channels therein which are to form the passageways for the cooling fluid. Thereafter the channels or grooves are evacuated and a vacuum seal provided. According to one process or method the parts have extending lips which are welded or otherwise joined together to form a seal for the evacuated channels. According to another method or process, the two parts after being fitted together are enclosed in a thin walled metal jacket of resilient material and the jacket evacuated and sealed. The sealed parts are then subjected for a suitable time and at a suitable temperature, as by placing in an autoclave, to a pressure in excess of that required to force the mating surfaces into intimate contact and sufficient to produce some deformation, with a resulting good bond but without so greatly reducing the cross-sectional area of the grooves or channels as to make them unsuitable for use as fluid flow passageways. One process aforedescribed is also a process for healing internal flaws. After the bonding is complete, the assembly is cooled and removed from the jacket, or the lips machined off, according to the process employed. An additional step may include annealing to produce further grain growth across the boundary between the parts joined together. In a further process, the passageway is filled with an inert gas at low pressure during the autoclave run. In an additional process, the passageway contains a solid or fluid "getter" material. In a still further process the passageway or passageways are continually pumped out while the assembled parts are being heated and subjected to external pressure.

3,748,197

METHOD FOR STABILIZING AND EMPLOYING TEMPERATURE SENSITIVE MATERIAL EXHIBITING MARTENSITIC TRANSISTIONS

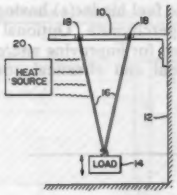
James R. Willson, Trumbull, Conn., and Donald W. Carey, Anaheim, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 828,243, May 27, 1969, Pat. No. 3,652,969. This application Sept. 14, 1971, Ser. No. 180,334

Int. Cl. C22f 1/10

U.S. Cl. 148—131 7 Claims

A method for dimension stabilizing temperature sensitive materials exhibiting martensitic transitions for use in control and work performing devices. The method includes subjecting the martensitic-transition material to a greater unit stress than the material would be required to work against in its application to thereby stretch the material beyond its expected deflection, and subsequently completing a number of temperature cycles while the material is in such overstressed condition, through which it is heated to a point above its transition temperature and cooled back to its annealed temperature. After treatment the material operates through complete work cycles with no loss of dimension stability.



3,748,198

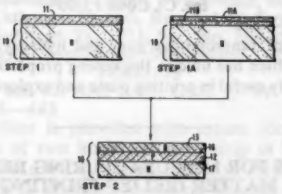
SIMULTANEOUS DOUBLE DIFFUSION INTO A SEMICONDUCTOR SUBSTRATE

Jagtar S. Basi, Wappingers Falls, and Jagtar S. Sandhu, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1970, Ser. No. 5,076

Int. Cl. H01l 7/34

U.S. Cl. 148—188 16 Claims



A simultaneous double diffusion method wherein a coating containing a silicon oxide and the oxides of a plurality of conductivity-determining impurities having different diffusivity rates is formed on the surface of a semiconductor substrate using a temperature at which substantially no diffusion of the impurities into the substrate will take place. Then, the substrate is heated to simultaneously diffuse the impurities into the substrate to form a plurality of abutting regions in the substrate separated by junctions. The sequence of regions in distance, with respect to the substrate surface, is controlled by the diffusivity rates of the selected conductivity-determining impurities. The coating may be a single layer or a plurality of layers, at least two of which contain different conductivity-determining impurities.

3,748,199

COMPOSITE PROPELLANTS CONTAINING HYDROXYLAMMONIUM PERCHLORATE

Calvin W. Vriesen, Newark, Del., and John C. Merges, Jr., Oxford, Pa., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Sept. 23, 1965, Ser. No. 490,777
Int. Cl. C06d 5/06
U.S. Cl. 149—19 13 Claims

A castable propellant composition including suitable curing agent(s) and a curable fuel binder(s) having a novel oxidizer, hydroxylammonium perchlorate. Optional propellant adjuvants are also disclosed for improving and/or increasing various propellant physical and chemical combustion characteristics.

3,748,200

SLURRY EXPLOSIVE COMPOSITIONS CONTAINING N,N' - DINITROSOPENTAMETHYLENETETRAMINE AS DENSITY CONTROL AGENT

Bhairab Nath Roy and Ranganatha Chandra Sekhar, Gomia, India, assignors to Imperial Chemical Industries, Limited, London, England

No Drawing. Filed Jan. 20, 1972, Ser. No. 219,529
Int. Cl. C06f 3/06
U.S. Cl. 149—30 12 Claims

A slurry explosive composition comprising at least one inorganic oxygen-supplying salt, a solvent, a thickener, a fuel and as a density control agent, N,N'-dinitrosopentamethylenetetramine.

3,748,201

THICKENING COMPOSITIONS CONTAINING XANTHOMONAS GUM AND HYDROXYALKYL ETHER OF GUAR GUM

Wesley A. Jordan, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Oct. 8, 1971, Ser. No. 187,892
Int. Cl. C06b 15/00
U.S. Cl. 149—109 5 Claims

A blend of xanthomonas gum and hydroxyalkyl ether of guar gum which has unique thickening properties. The blend is particularly useful in printing paste and explosive slurries.

3,748,202

PROCESS FOR MANUFACTURING REPRINTED MATTER (RELIEF PRINTING)

Yoshiharu Iisaka, Yasuo Katsurada, and Shigeo Suzuki, Tokyo-to, and Takatoshi Saijo, Kawasaki, Japan, assignors to Kyodo Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1969, Ser. No. 889,369
Claims priority, application Japan, Apr. 19, 1969, 44/30,474
Int. Cl. B44c
U.S. Cl. 156—59 13 Claims

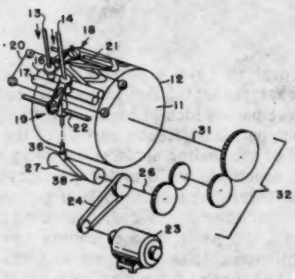
The present invention relates to a relief printing process for obtaining a perfect printed replica or reproduction of an original oil painting or the like without losing a bit of its unique quality or relish. The process comprises means for printing patterns in the uneveness such as projections and recesses of an original on a suitable base material to thereby prepare a pattern-duplicated structure, means for making a press mold having shaped therein the unevenness corresponding to said printed patterns directly from the original with an easily partable material without damaging said original, means for retaining a hardenable material on said pattern-duplicated structure or in the unevenness of said press mold so that the printing face of said pattern-duplicated sheet will have its printed patterns and unevenness combined integrally under hardened or unhardened condition, and means for stripping said press mold from the hardened material and forming a duplicate structure shaped with the unevenness corresponding to the printed patterns on the printed face of said pattern-duplicated structure.

3,748,203

METHOD AND APPARATUS FOR POSITIONING A PLURALITY OF CONTINUOUS STRIPS ON A SUPPORT SURFACE

Charles W. Greene, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 12, 1971, Ser. No. 133,140
Int. Cl. B61h 81/02
U.S. Cl. 156—175 9 Claims



A method for positioning a plurality of strips on a support surface in a desired pattern wherein the strips and the support surface have a pressure sensitive adhesive affinity for each other, the method comprising the steps of passing each strip into contact with a rotating intermediate surface, transferring each strip from the intermediate surface to the support surface and pressing each strip against the support surface with rolling pressure adjacent the contact point of the strip with the support surface; each strip including a multiplicity of continuous cords with the relative point of contact between each strip and the support surface being such that each strip is positioned on the support surface in a preselected pattern with respect to the other strips positioned on the support surface. Also, apparatus for conducting the above method.

3,748,204

PROCESS FOR PRODUCING LAMINATED PAPER

Teruo Murayama, Saitama, Kazuhiko Honda, Tokyo, and Tsuneo Kasugai and Nobuhiko Minagawa, Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

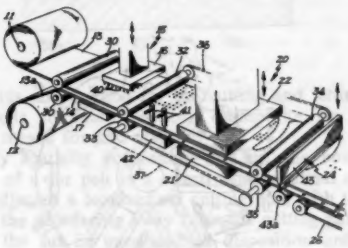
No Drawing. Filed Feb. 23, 1971, Ser. No. 118,167
Claims priority, application Japan, Feb. 23, 1970, 45/15,381
Int. Cl. B29c 19/02; B44d 1/50
U.S. Cl. 156—244 12 Claims

Method of producing a synthetic resin-laminated paper by simultaneously coating a synthetic resin on both sides of the paper and applying microwave energy at the same time.

3,748,205
METHOD AND APPARATUS FOR MAKING A PROFILE BAG STRUCTURE

Richard C. Adams, West Barrington, R.I., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed May 27, 1971, Ser. No. 147,445
Int. Cl. B32b *31/00*
U.S. Cl. 156—252 4 Claims



Method and apparatus for preparing contoured bags from plural layers of heat sealable flexible film, the apparatus comprising web retaining means for receiving and retaining a supply of flexible film thereon, along with a web supporting surface for receiving film from said retaining means in the form of a web, the supporting surface defining a web traveling plane. Draw roll means are provided for imparting intermittent motion and dwell to the web as it travels along the web traveling plane. A first web treating station is disposed along the support surface with web sealing-serrating means being provided for making intermittent contact with spaced points along the web for forming a generally continuous sealed-serration line. The sealed-serration line defines a predetermined isolated scrap zone along the web and is adapted for easy removal therefrom. A second web treating station is disposed along the support surface downstream from the first web treating station, the second treating station having web welding and severing means in the form of a welding bar for making intermittent contact with the web during web-dwell to weld and sever the web to form individual repeating flexible film products such as bags therefrom. In this fashion, contoured bags suitable for retaining irregularly shaped articles such as bananas and the like may be prepared. The apparatus may optionally include re-wind means which are arranged to wind the flexible film product upon a product roll, it being understood that the welding bar would be adjusted to merely seal and not sever the sides of the bags being formed along the roll.

3,748,206
CURED POLYFERROCENYLENES AND PROCESS FOR CURING

Norman Bilow, 6118 S. Condon Ave., Los Angeles, Calif. 90056, and Harold Rosenberg, 3244 Early Road, Dayton, Ohio 45415

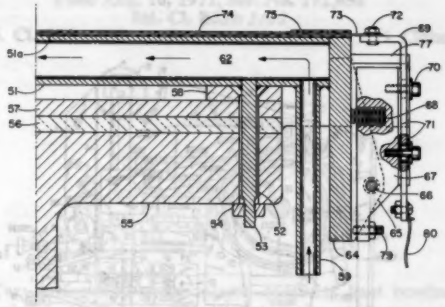
No Drawing. Original application Mar. 6, 1969, Ser. No. 805,008, now Patent No. 3,640,959. Divided and this application May 26, 1971, Ser. No. 147,253
Int. Cl. C09j *3/14, 5/06*
U.S. Cl. 156—327 11 Claims

Cured polyferrocenylenes and the process for curing them are disclosed. Low molecular weight thermoplastic polyferrocenylenes are reacted with aromatic dicarboxaldehydes. The resulting copolymers cross-link and cure to hard, heat-resistant, radiation-resistant structures upon treatment with heat and pressure.

3,748,207
MECHANISM FOR HEAT SEALING

James F. Campbell and Ernst Daniel Nystrand, Green Bay, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 26, 1971, Ser. No. 175,191
Int. Cl. B32b *31/00*
U.S. Cl. 156—359 9 Claims



Equipment for heat sealing products having at least one thermoplastic component is described. The mechanism for heat sealing itself included means for pre-heating an electrical heating element which supports the product to be heat sealed. The electrical heating element is associated with means for controlling the duration and value of the electric heating current. The electric current is conveniently proportioned to machine speed so that products moving through the equipment at lower speed may be subjected to a less intense heating current. The sealing operation is specifically applied to diapers of the disposable type having a liquid impervious polyethylene backing, a liquid permeable reinforced paper tissue, a filling of absorbent material, and an insert of high melt index polyethylene film material to provide at diaper ends a structure in the form of a dam.

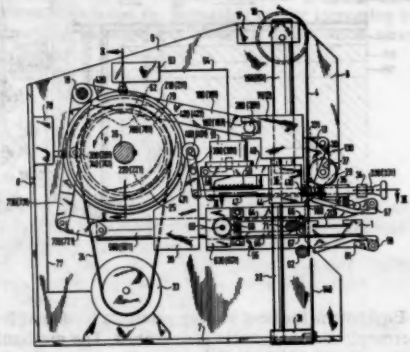
3,748,208
FILM SPLICING APPARATUS

Oskar Schnellmann, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Sept. 28, 1971, Ser. No. 184,454
Claims priority, application Switzerland, Oct. 2, 1970, 14,623/70
Int. Cl. B31f *5/06;* G03d *15/04*
U.S. Cl. 156—443 7 Claims

A film splicer is provided with means for supporting end portions of two lengths of film strip in longitudinal alignment at a splicing station and with their ends abutting. A knife is disposed to cut off lengths of adhesive tape of the kind having a tacky side and a non-tacky side drawn from a tape supply. A transport mechanism is arranged to feed the forward end of a length of tape from the cutting knife along a path transverse to the longitudinal direction of the film strip over and past a first tape support surface with the non-tacky side turned theretowards, past the splicing station with the tacky side of the tape turned towards the film portions, and onward until the forward end of the tape makes contact with a second tape support surface beyond the splicing station and the length of tape spans a gap defined between the two tape support surfaces. A pair of tape engaging arms are disposed one on each side of the plane of the film strip at the splicing station. The arms are movable together generally towards the respective tape support surfaces to engage the tacky side of the length of tape when spanned across the gap between the tape support surfaces and are movable together away from said tape support surfaces.

The ends of the tape engaging arms are arranged to perform a continuous closing motion towards each other during the return movement from the tape support surfaces and in such manner as to draw the length of tape adhering to the ends of the arms about the abutting end portions of the film strip commencing from one edge thereof. Wiper means are also provided, comprising a pair of wiper members biased towards each other and



adapted for movement together with one member disposed on each side of the plane of the film strip. The wiper members are arranged to engage the film strip with the length of tape drawn thereabout and to smoothly press the tacky side of the tape against both surfaces of the film strip commencing from the aforementioned one edge and travelling progressively across the width of the film ends.

3,748,209

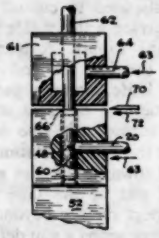
APPARATUS FOR MAKING IMPLANT CAPSULES

Whitney Lombard Pearson and John Alexander Banford, Lake Bluff, and Earl Thaddeus Szymanski, Chicago, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Original application Oct. 2, 1969, Ser. No. 864,949, now Patent No. 3,625,786. Divided and this application Apr. 30, 1971, Ser. No. 139,062

Int. Cl. B32b *31/00*

U.S. Cl. 156—510 **2 Claims**



A tubular capsule is sealed by forcing the tip of a rod into the end of the capsule cavity, preferably while the volume of the capsule is reduced. Apparatus suitable for use in a multistation capsule manufacturing operation is provided.

3,748,210

ROTARY LABEL TRANSFER APPARATUS

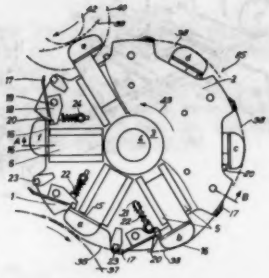
Gerhard Beutl, Neutraubling, Germany, assignor to Kronseder, Herrmann, Neutraubling, Germany

Filed July 12, 1971, Ser. No. 161,759

Claims priority, application Germany, July 17, 1970, P 20 35 477.2

Int. Cl. B65c *9/08, 9/00*; B65h *5/12*

U.S. Cl. 156—567 **10 Claims**



Rotary label transfer apparatus or gripping cylinder having a series of projectable and retractable label carrying pallets and a corresponding series of openable and closeable grippers for holding labels on the pallets. One stationary cam directly controls successive movements of the pallets, and mechanism responsive to the movement of the respective pallets controls the grippers for the next succeeding pallets. The cam is desirably made up of an assembly of adjustable cam segments.

3,748,211

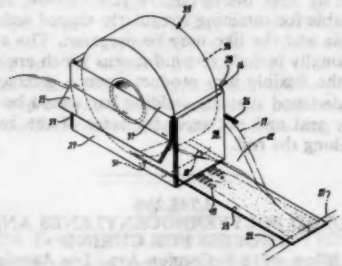
CARPET TAPE DISPENSER

Merle R. Hoopengardner, 2509 Myrtle St., Oakland, Calif. 94607

Filed June 30, 1971, Ser. No. 158,417

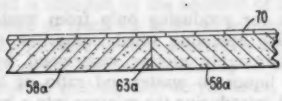
Int. Cl. B32b *31/04*

U.S. Cl. 156—575 **15 Claims**



A dispenser for carpet seaming tape dimensioned for mounting between upturned juxtaposed edges of adjacent carpet sections to be seamed and formed for directional release of tape parallel to such edges; and means on the dispenser for engagement with and for bearing upon the upturned carpet edges for retaining the dispenser centrally between the edges upon displacement longitudinally thereof thereby effecting automatically the laying of a strip of tape centrally of and underlying the carpet edges to be seamed.

3,748,212
FABRICATION OF COMPOSITE FUR PELT
Carl P. Piampiano and Corra J. Piampiano, both of 2601 Wadsworth Road, Zion, Ill. 60099
Filed Aug. 23, 1971, Ser. No. 173,788
Int. Cl. C14b *1/00, 15/00*
U.S. Cl. 161—36 37 Claims



Apparatus and method for the cutting and letting out of fur pelts to fabricate novel composite fur pelts, including means for and steps of

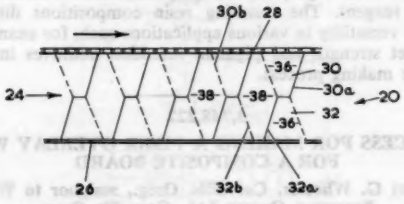
stationarily spatially positioning the fur side boundary surface of a fur pelt in a selective longitudinal cutting plane adjacent a longitudinal cutting path with the fur side of the pelt facing away from the cutting path and having the fur in uncompacted disposition and with the non-fur side boundary surface of the pelt extending into such cutting path, and

cutting the pelt into parallel longitudinal portions or strips along the cutting path by completely cutting through the thickness of the pelt in a direction from the non-fur side to a depth coinciding with said cutting plane at the fur side boundary surface without cutting into the fur and without disturbing the corresponding stationary spatial positioning of the resultant cut portions, and

letting out such cut portions by longitudinally moving the cut portions relative to one another to a positional relation in which the cut portions are in successive incremental longitudinally offset relation with respect to their original positional relation while maintaining said spatial positioning of said cut portions,

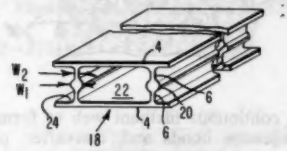
to permit the reconnecting of the cut portions to one another in said offset relation and spatial positioning by applying a pelt bonding agent to the seams of the adjacent offset portions, to form a composite, let out and correspondingly reconnected fur pelt having the fur thereof intact in uncut condition and the seams free from any interposed fur hair thereat.

3,748,213
ACOUSTIC LININGS
Anthony George Kitching, Duffield, and Mervyn Brown, Ticknall, England, assignors to Rolls-Royce Limited, Derby, England
Filed Mar. 15, 1971, Ser. No. 124,057
Claims priority, application Great Britain, Mar. 13, 1970, 12,058/70
Int. Cl. B32b *3/12;* G10k *11/04*
U.S. Cl. 161—68 5 Claims



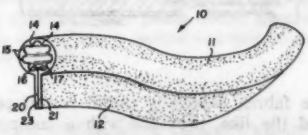
An acoustic lining which can be applied to parts of a gas turbine jet engine where noise attenuation is required. The acoustic lining comprises a core member sandwich between an impervious sheet and a perforate sheet. The core member comprises a plurality of elongate alternately arranged substantially V-shaped cells, and diamond-shaped cells.

3,748,214
CHANNEL STRUCTURE
Michael Somerville Withers, Landenberg, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 16, 1971, Ser. No. 171,856
Int. Cl. B32b *3/12*
U.S. Cl. 161—122 1 Claim



Two surfaces of thermoplastic resin are heat bonded together by having one surface contain ribs which are contact-heated to the molten condition, followed by immediate lamination to the other surface. The contact-heating is done by passing the ribs along a hot bar at a high enough temperature above the melting point of the resin so that the resultant molten resin does not stick to the bar. One article made by this process is a laminate of two films having ribs extending therefrom heat-bonded rib-to-rib.

3,748,215
HOLLOW TUBULAR WINDLACE
Anthony J. Lenzi, Rochester, N.Y., assignor to The Schlegel Manufacturing Company, Rochester, N.Y.
Filed Nov. 26, 1971, Ser. No. 202,227
Int. Cl. B32b *3/20*
U.S. Cl. 161—139 11 Claims

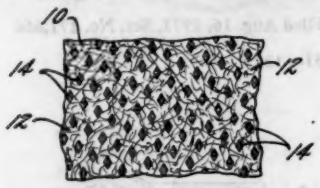


A windlace is extruded of a flexible, thermoplastic material to form a hollow tubular body with an integral flange. The interior of the tubular portion has a plurality of longitudinal ridges separated by longitudinal grooves to allow bending of the windlace without collapsing the tubular portion. The windlace is preferably extruded in a generally flat configuration, embossed, and then formed into a tube with two halves of the flange joined together in a longitudinal plane generally radial to the tube and extending between two halves of one of the internal ridges to support the windlace in the desired shape.

3,748,216
SOFT CONTINUOUS FILAMENT WEBS CONTAINING ENCAPSULATED FILAMENTS
Robert J. Brock, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Mar. 22, 1971, Ser. No. 126,524
Int. Cl. B32b *7/14*
U.S. Cl. 161—148 6 Claims

Nonwoven webs comprised of a plurality of substantially continuous and randomly deposited, molecularly

oriented filaments of a thermoplastic polymer are disclosed. The webs contain easily releasable, intermittent autogeneous bonds at a plurality of filament crossover points. In addition, the webs are stabilized by means of an easily disruptable polymeric material which encapsulates the filaments at intermittent, discrete areas. The webs can be readily prepared by lightly heat bonding a flimsy



and tenuous continuous filament web to form easily releasable autogenous bonds and, thereafter, printing the web with a disruptable polymeric material. Webs so formed possess particularly outstanding strength characteristics, especially with respect to energy absorption and tensile and tear strength. In addition, the softness of the webs can be enhanced by a moderate "working" of the web so as to break the easily releasable autogenous bonds.

3,748,217

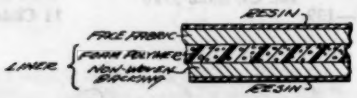
LINED TEXTILE FABRIC AND METHOD OF MANUFACTURE

Robert E. May and Benny L. Triplett, Pleasant Garden, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 24, 1971, Ser. No. 118,345

Int. Cl. B32b *3/26, 5/18*

U.S. Cl. 161—159 **15 Claims**



A textile fabric, especially useful for drapery manufacture and the like, provided with a composite lining in intimate contact with the textile fabric, is disclosed. The composite liner includes a coherent layer of spunlaced nonwoven fabric and a foamed organic polymer which is in intimate contact with both the textile fabric and the spunlaced nonwoven fabric. The combination of the foamed organic polymer and the spunlaced nonwoven backing material provides the textile fabric with unusual and improved characteristics of appearance and feel.

3,748,218

RIGID MULTILAYER FORMED SHEET STRUCTURES

Ritchey O. Newman, Jr., Midland, and Walter J. Schrenk, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 8,058, Feb. 2, 1970, now Patent No. 3,645,838. This application Oct. 4, 1971, Ser. No. 186,291

Int. Cl. B32b *27/08*

U.S. Cl. 161—253 **5 Claims**

This invention provides economical multilayer sheets that combine high barrier layers with layers of rigid polyvinyl chloride or impact polystyrene.

3,748,219

BATCH DIGESTION OF WASTEWOOD

Joseph F. Mole and James V. Nichols, Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed June 13, 1972, Ser. No. 262,207

Int. Cl. D21c *7/12*

U.S. Cl. 162—61 **4 Claims**

A process for producing pulp from wastewood in a batch digesting operation which comprises, (a) prior to digesting, thoroughly mixing wastewood with cooking liquor at a liquor to wastewood ratio of between 3:1 and 7:1, (b) introducing the mixture into a batch digester and heating the mixture at a temperature from about 280° F. to 320° F. and a pressure of from 30 to 70 p.s.i.g. for from about 15 to 50 minutes, and (c) digesting at a temperature from 330° F. to 360° F. and pressure of 90 to 120 p.s.i.g. The total cooking time is 90 to 180 minutes, preferably 105 to 120 minutes. The chemical pulp produced from wastewood by this process is consistenly clean and uniform.

3,748,220

PITCH STABILIZATION IN PAPERMAKING

Andrew J. Gard, 12 Orchard St., Wellesley, Mass. 02181

No Drawing. Continuation of abandoned application Ser. No. 1,329, Jan. 7, 1970. This application Apr. 7, 1972, Ser. No. 242,259

Int. Cl. D21c *3/20*

U.S. Cl. 162—72 **2 Claims**

A method of stabilizing pitch in paper pulp by adding to the pulp an aqueous solution of nitrilotriacetic acid sodium salt and a water soluble acrylic polymer.

3,748,221

PROCESS OF MAKING PAPER CONTAINING CHAIN EXTENDED POLYAMINE RESIN COMPOSITIONS AND PAPER MADE THEREFROM

Hans H. Stockmann, Plainfield, and Dilip K. Ray-Chaudhuri, Somerset, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Application Apr. 13, 1970, Ser. No. 27,999, now Patent No. 3,647,763, which is a continuation-in-part of abandoned application Ser. No. 734,894, June 8, 1968. Divided and this application Oct. 28, 1971, Ser. No. 193,539

Int. Cl. D21h *3/58*

U.S. Cl. 162—164 **6 Claims**

High molecular weight, chain extended copolyamide-polyamine resin compositions comprising the reaction product of a chain extension reagent with a copolyamide-polyamine intermediate which comprises the reaction product of a lactone or an alkylester of acrylic or methacrylic acid, a polyalkylene polyamine and a carboxylic acid reagent. The resulting resin compositions display great versatility in various applications such, for example, as wet strength and pigment retention additives in the paper making process.

3,748,222

PROCESS FOR MAKING A FIBER OVERLAY WEB FOR A COMPOSITE BOARD

Robert G. Wheeler, Corvallis, Oreg., assignor to Wood Processes, Oregon Ltd., Corvallis, Oreg.

Filed Oct. 20, 1971, Ser. No. 190,764

Int. Cl. D21f *3/04*

U.S. Cl. 162—165 **4 Claims**

A process for making a moist web for use in forming an overlay for a composite assembly of board or panel

components to be cured in a hot press, the web being formed from a slurry of cellulosic fiber pulp to which has been added a proportionate amount of a pale, thermoplastic, neutral hydrocarbon resin in water suspension. After thoroughly mixing these together, additional quantities of paraffine wax emulsion size and of phenol-formaldehyde resin are added. After this has been thoroughly mixed the pH is adjusted by the addition of a quantity of alum to a value of from 4.5 to 5. An aqueous pigmented color coating mixture is then preferably applied to the outer surface of the wet web consisting of water, a basic polymer emulsion such as vinyl acrylic latex, vinyl acetate homopolymer or acrylate ester copolymer and pigment. The resultant skins of the panel emerging from the hot press separate freely from the platens or caul plates with no residue buildup even though the latter may have rough or uneven pattern embossing surfaces.

3,748,223

WET-END DISPOSITION OF LATICES ON FIBERS

Elmer R. Urig, 225 James Circle, Avon Lake, Ohio 44012

No Drawing. Continuation of abandoned application Ser. No. 24,840, Apr. 1, 1970. This application Jan. 14, 1972, Ser. No. 218,016

Int. Cl. D21d *3/00*

U.S. Cl. 162—169 **10 Claims**

In the incorporation of latex into fibers in water dispersion and the deposition of polymers thereon by coagulation with coagulants, an improved process and product are obtained when there is also added less than 5 parts of an anionic water soluble polymer such as polyacrylic acid per 100 parts of polymer in the latex.

3,748,224

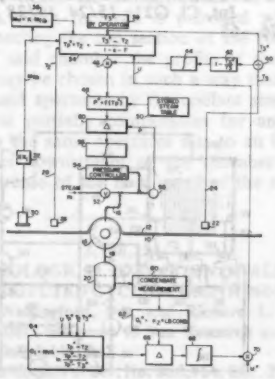
CONTROL SYSTEM FOR THE PRE-DRYER SECTION OF A PAPER MACHINE

W. Robertus J. Tillie, New York, N.Y., and James T. Carleton, Pittsburgh, and Richard E. J. Putman, Penn Hills, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1970, Ser. No. 92,347

Int. Cl. D21f *5/06*; G06f *15/46*

U.S. Cl. 162—252 **5 Claims**



System for controlling the pressure of steam introduced into a paper drying drum in such a way that the temperature of the paper web leaving the drum will be constant. This is accomplished by deriving a predictive feed-forward signal from consideration of a heat balance around the drum and by varying the predictive signal with a feedback signal proportional to actual exit temperature. The modified feed-forward signal is then used as an error signal for controlling the steam pressure within the drum, and, hence, its temperature.

3,748,225

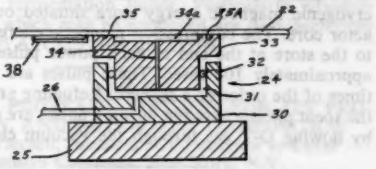
FIBROUS WEB PRESS NIP STRUCTURE INCLUDING NONPOROUS BELTS BACKED BY PISTONS SUPPORTED WITH FLUID PRESSURE

Leroy H. Busker, Rockton, and Carl J. Francik, Roscoe, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Nov. 19, 1970, Ser. No. 90,921

Int. Cl. D21f *3/06*

U.S. Cl. 162—272 **8 Claims**



An extended nip press device for removing fluids from a fibrous web and including a pair of endless looped non-porous belts positioned to define a nip of at least 6 inches in length. A porous belt or felt is positioned to pass through the nip and is used as a web carrying device. The pressure exerted in the nip is caused by a piston positioned inside the loop of each of the nonporous belts having a force transmitting surface contacting the nonporous belts substantially across the width and length of the nip. Lubrication lines are provided for each piston so as to lubricate the surface contacting the nonporous belt. Deflection control structure defining a fluid reservoir and positioned to accept one of the pistons in each reservoir is further provided, and includes feed lines for supplying fluid to the reservoir in an amount sufficient to support the piston in the reservoir. Force supplied by the piston on the nonporous belt is balanced by the deflection control structure so as to prevent deflection of the piston.

3,748,226

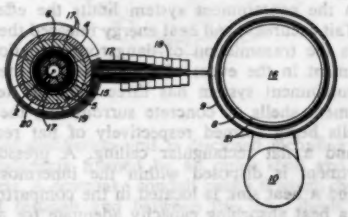
PULSED HIGH-BETA FUSION REACTOR

Fred L. Ribe, Sibley C. Burnett, and William R. Ellis, Los Alamos, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed May 18, 1972, Ser. No. 254,689

Int. Cl. G21b *1/00*

U.S. Cl. 176—3 **15 Claims**



A fusion reactor in which the thermonuclear plasma is produced by a staged theta pinch having two distinct energy sources, one for shock heating and one for adiabatic compression. In the reactor core the plasma is surrounded

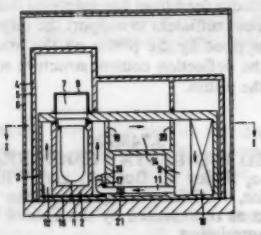
by a thin liquid-metal-cooled vacuum wall which also serves as a shock heating coil. This coil is driven by high voltage circuits whose energy content is only a few percent of that of the total system. The low-voltage compressional and confining magnetic field, whose energy is preponderant, has a risetime of a few milliseconds and is generated by a multiturn coil whose radius is substantially greater than that of the shock-heating coil. The compression coil operates near room temperature, and the system is sufficiently economical of joule losses that they can largely be made up by direct energy conversion from the expansion of the high-beta plasma against the magnetic field during the burning pulse. The compression coil is protected from excessive nuclear radiation and heating by a portion of the neutron-moderating, tritium-breeding blanket. This inner portion of the blanket operates at a temperature as high as about 800° C. Magnetic energy is switched reversibly into the compression coil from a cryogenic magnetic energy store situated outside the reactor core. The compression magnetic energy is returned to the store at the end of each power pulse, which lasts approximately 100 msec. These pulses are separated by times of the order of a few sec. Refueling and flushing of the spent plasma between burning pulses are accomplished by flowing D-T gas through the vacuum chamber.

3,748,227

CONTAINMENT SYSTEM FOR A SODIUM COOLED REACTOR

Heinz Hillekum, Cologne-Dellbruck, and Ludwig Lange, Bensberg-Refrath, Germany, assignors to Interatom Internationale Atomreaktorbau GmbH, Bensberg, near Cologne, Germany

Filed Oct. 21, 1971, Ser. No. 191,403
Claims priority, application Germany, Oct. 24, 1970, P 20 52 335.7
Int. Cl. G21c *9/00*
U.S. Cl. 176—38 **12 Claims**



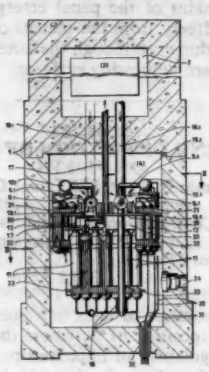
A containment system is provided for a sodium cooled reactor having a heat removal system for removing heat energy generated in the reactor during normal operation, wherein the containment system limits the effects of a Bethe-Tait excursion and heat energy released thereby and prevents the transmission of dangerous radiation to the environment in the event of an accident in the reactor. The containment system has three mutually telescoped containment shells of concrete surrounding the reactor, the shells being formed respectively of flat rectangular walls and a flat rectangular ceiling. A pressure relief compartment is disposed within the innermost of the shells and a heat sink is located in the compartment and having a heat absorbing capacity adequate for absorbing the heat energy released by the reactor in the event of an accident therein as well as for absorbing the heat energy present during a simultaneous failure of the heat removal system. The innermost shell is resistant to pressure and is at least partially penetrable by gas.

3,748,228

NUCLEAR POWER STATION FOR A GASEOUS WORKING MEDIUM

Ulrich Zimmermann, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed May 6, 1969, Ser. No. 822,220
Claims priority, application Switzerland, May 17, 1968, 7370/68
Int. Cl. G21c *19/28*
U.S. Cl. 176—60 **16 Claims**



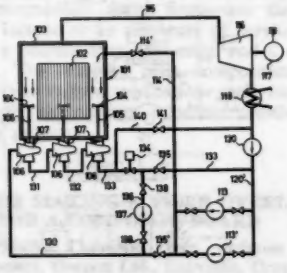
The nuclear power station is constructed so that a working gas is conducted through a closed cycle. The reactor, power station and heat exchangers are accommodated in a pressure tight vessel while the starting point and end point of the working gas thermal work path are disposed in a sub-chamber with the power station.

3,748,229

CIRCULATING SYSTEM FOR A NUCLEAR PRESSURE VESSEL

Jurgen Heinrich Schill, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed June 2, 1971, Ser. No. 149,229
Int. Cl. G21c *15/24, 19/28*
U.S. Cl. 176—65 **6 Claims**



The turbines for driving the circulating pumps are connected in series in the flow of the working medium. The turbines can be arranged in a closed ring along with a

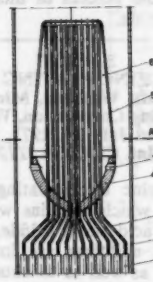
pump and can be provided with by-pass lines should it be necessary to shut down one or more turbines. Also, sets of serially connected turbines can be connected in parallel.

3,748,230

FUEL ELEMENT FOR FAST REACTORS WITH A DEVICE FOR EXHAUSTING THE FISSION GASES THEREFROM

Augusto Gerosa and Marco Martini, Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare, Rome, Italy

Filed Aug. 6, 1969, Ser. No. 847,829
Claims priority, application Italy, Aug. 20, 1968, 39,198/68, Patent 845,291
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 6 Claims



The invention provides a means for exhausting the fission gases from the rods of a nuclear reactor fuel element while preventing the coolant from reaching the inside of the rods on any transient conditions of the reactor. Said means comprises a vertically elongated chamber which is superimposed to the fuel element and is sealed at its top and side walls, a series of apertures being provided only at the lower section of it at a short distance from the top end of the fuel element rods which apertures communicate the inside of the chamber with the surrounding space where the coolant stream of the reactor flows upwards. Each fuel rod is provided with a very thin tube connecting the top section of the rod with the top section of said chamber the profile of the side wall of the latter may be chosen in such a way that a suction is applied to said apertures by the coolant stream which suction at least partially compensates for any increase of pressure on the same apertures due to an increase of frictional losses downstream of the chamber whenever there is an increase of the flow speed of the coolant.

3,748,231

MICROBIOLOGICAL OXIDATION OF ALKYL-SUBSTITUTED CYCLIC COMPOUNDS

Peter Hosler, Wallingford, Pa., and Richard L. Raymond, Wilmington, Del., assignors to Sun Research and Development Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 888,964, Dec. 29, 1969, abandoned. This application Jan. 27, 1972, Ser. No. 221,446
Int. Cl. C12d *13/00*
U.S. Cl. 195—28 R 7 Claims

The β-carbon atom of C_2–C_3 alkyl side-chains of mononuclear aromatic or cycloaliphatic compounds may be oxidized by certain organisms of the genus Nocardia to form the corresponding hydroxy and/or keto derivatives thereof.

3,748,232

PROCESS FOR PREPARING 5-AMINO-4-IMIDAZOLE CARBOXAMIDE RIBOSIDE

Yuichi Noguchi, Kazumi Araki, and Naonori Aoki, Hofushi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Continuation of application Ser. No. 677,866, Oct. 25, 1967. This application June 17, 1968, Ser. No. 737,374
Claims priority, application Japan, Oct. 28, 1966, 41/70,719
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N 9 Claims

A process for the preparation of 5-amino-4-imidazole carboxamide riboside by fermentation which comprises culturing certain strains of microorganism belonging to the genus Brevibacterium in an aqueous nutrient medium under aerobic conditions and accumulating and recovering the 5-amino-4-imidazole carboxamide riboside from the resultant fermentation liquor. Particularly advantageous strains which may be employed are *Brevibacterium ammoniagenes* ATCC 21105 and 21106.

3,748,233

ALKALINE PROTEASE, METHOD FOR ITS PRODUCTION, AND DETERGENT COMPOSITION

John P. Viccaro, Jamaica, N.Y., assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Sept. 8, 1969, Ser. No. 856,182
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R 6 Claims

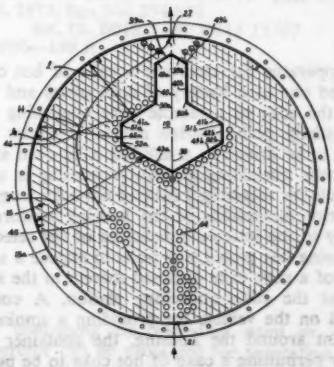
Alkaline protease is obtained by propagating the organism *Bacillus licheniformis* A.T.C.C. No. 21424 in nutrient media and thereafter recovering the enzyme from the media.

3,748,234

LIQUID DISTILLATION UNIT WITH POLYGONAL DOWNCOMER

John E. Pottharst, Jr., 861 Carondelet St., New Orleans, La. 70130

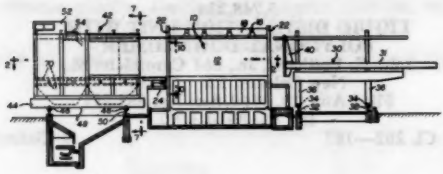
Filed Aug. 19, 1969, Ser. No. 851,251
Int. Cl. B01d *3/00*
U.S. Cl. 202—187 8 Claims



A liquid distillation unit is disclosed including an improved calandria formed by an outer shell and spaced tube sheets. A downtake conduit passes through the calandria and through and between the tube sheets and is surrounded by a plurality of heat exchange tubes passing between and through the tube sheets. The calandria includes an inlet and an outlet located on opposite sides so that vapor passes from the inlet across the heat exchange tubes to the outlet. The heat exchange tubes are arranged between the inlet and the outlet in multiple,

parallel first rows substantially parallel with the axis passing through the inlet and outlet. Heat exchange tubes in adjacent first rows are offset with respect to each other, thus arranging the tubes in second and third multiple, parallel rows at acute angles with the first rows. The downtake conduit is located adjacent the outlet and its walls form a polygonal outline in cross-section generally symmetrical about the axis between the inlet and the outlet. Each of the walls of the downtake conduit are parallel to one of said first, second or third rows and are closely spaced to the heat exchange tube in adjacent rows. The walls of the downtake conduit are also proportioned and located with respect to the outer shell to provide a flow space for the vapor around the tubes and between the downtake conduit and the outer shell which is reduced in the flow direction from the inlet toward the outlet for maintaining the vapor velocity more constant as it flows toward the outlet than would be the case if the downtake conduit were not so proportioned and located.

3,748,235
POLLUTION FREE DISCHARGING AND QUENCHING SYSTEM
Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. GmbH, Bochum, Germany
Filed June 10, 1971, Ser. No. 151,891
Claims priority, application Germany, Feb. 15, 1971, P 20 29 432.0
Int. Cl. C10b *33/00, 39/08*
U.S. Cl. 202—227 **9 Claims**



An apparatus for receiving a cake of hot coke from a selected one of a battery of coke ovens and for transporting the coke to a remote coke quenching station in an essentially pollution-free manner includes a vehicle adapted to be driven to a selected coke oven and thence to the coke quenching station. A housing is carried on the vehicle for receiving a cake of hot coke from an oven, the interior dimensions of the housing conforming substantially to the interior dimensions of the selected oven. The housing has grated side walls to expose a substantial portion of a coke cake disposed therein to the spray generated at the coke quenching station. A container is mounted on the vehicle for providing a smoke-tight environment around the housing, the container having a door for permitting a cake of hot coke to be pushed into the housing. Guide means are provided for establishing a smoke-tight passage between a selected oven and the container so that a cake of hot coke may be pushed into the housing through the guide means without polluting the surrounding environment.

A method is also disclosed for providing a pollution-free transfer of hot coke from an oven into a coke-receiving housing of a coke-carrying vehicle for transportation of the coke to a remote coke-quenching tower. The method comprises the steps of providing a smoke-tight passage between the oven and the housing, and pushing the hot coke out of the oven into the housing through the passage.

ERRATUM

For Class 203—8 see:
Patent No. 3,747,988

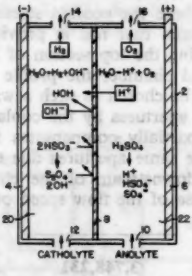
3,748,236
ADDITIVE FOR NICKEL PLATING BATHS
William R. Schevey, Hawley, Pa., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed July 20, 1972, Ser. No. 273,574
Int. Cl. C23b *5/08, 5/46*
U.S. Cl. 204—49 **6 Claims**

Acid nickel plating bath for obtaining bright nickel deposits, said bath being of the chloride, sulfate, fluoborate or sulfamate type and containing a brightener mixture comprising the disodium salt of methylene bis naphthalene sulfonic acid and a second component selected from coumarin, piperonal bisulfite complex, sodium beta-styrene sulfonate, benzimidazole and mixtures thereof, with the proviso that benzimidazole is used only when greater than 50 mole percent of nickel salt used in the bath is nickel fluoborate.

3,748,237
ZINC PLATING
Hans Gerhard Creutz, Westland, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.
No Drawing. Filed July 14, 1971, Ser. No. 162,690
Int. Cl. C23b *5/12*
U.S. Cl. 204—55 R **24 Claims**

A non-cyanide zinc electroplating bath contains an organic compound which contains within this structural formula a sulfonic acid and a sulfide, mercapto or polysulfide group. The additives are introduced to obtain a bright zinc plate, as well as to obtain a leveling effect.

3,748,238
ELECTROLYTIC PROCESS FOR THE PREPARATION OF SODIUM HYDROSULFITE
Allyn H. Heit, San Mateo, Calif., and James N. Williamson, Marlton, N.J., assignors to Sybron Corporation, Rochester, N.Y.
Filed May 8, 1972, Ser. No. 251,293
Int. Cl. C01d *5/00*; C23b *5/16*; B01k *3/04*
U.S. Cl. 204—92 **9 Claims**



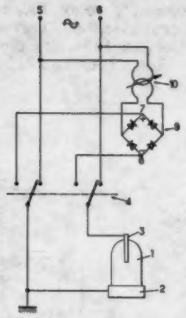
Sodium hydrosulfite is prepared from sodium bisulfite or sodium metabisulfite in an electrodialytic apparatus provided with a special spongy, porous lead electrode used therein as a cathode, which substantially fills the catholyte chamber of the apparatus. The spongy, porous lead electrode which makes the cathodic reduction of the bisulfite ion feasible in the electrodialytic apparatus, is produced from the alkali metal plumbities in an electrodialytic apparatus having an anode chamber and at least one cathode chamber adjacent the anode chamber with designated ion migrating means (membranes) positioned

between the anode and cathode chambers. The bisulfite ion reduction to hydrosulfite anion is carried out in the same electrodialysis apparatus as, or an electrodialysis apparatus similar to, the apparatus used to produce the spongy, porous lead electrode.

3,748,239
METHOD OF ELECTROLYTICALLY MARKING A METALLIC ARTICLE

Pierre de Lacroix de Lavalette, Paris, France, assignor to Societe Anonyme dite: SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Aug. 19, 1971, Ser. No. 173,158
Claims priority, application France, Sept. 8, 1970, 7032618
Int. Cl. B23p *1/00*
U.S. Cl. 204—129.4 **1 Claim**



Method of electrolytically marking a metallic article by first applying an alternating current between an electrode and said article and then applying a direct current therebetween.

3,748,240
SACRIFICIAL ELECTRODE SYSTEM FOR REMOVAL OF HEAVY METAL IONS FROM WASTE WATER

Edward E. Johnson, Sweeny, Ralph N. Buggs, Missouri City, and Richard L. Kornmann, Lake Jackson, Tex., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed June 7, 1972, Ser. No. 263,368
Int. Cl. C02c *5/12;* **C02b** *1/82*
U.S. Cl. 204—149 **7 Claims**

Method of and cell system for removing heavy metal ions from solution in waste water which consists of electrolyzing and precipitating said ions as acid insoluble sulfides at a pH below 7 utilizing a carbon/carbon electrode pair wherein the cathode (sacrificial) contains 20–80% cathode weight of elemental sulfur. Heavy metal ions forming acid insoluble sulfides include the preferred mercury and silver, lead, cadmium, and copper.

3,748,241
PRODUCTION OF CELLULOSIC GRAFT POLYMERS OR COPOLYMERS BY THE USE OF A MINERAL ACID AND RADIATION

John Lyndon Garnett, 29 Arabella St., Longueville, New South Wales, Australia, and Sergio Dilli, 14 Fitzroy St., Croydon, New South Wales, Australia

No Drawing. Filed Mar. 1, 1972, Ser. No. 230,968
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.12 **6 Claims**

A process for the production of graft polymers or copolymers by ionising radiation in the presence of mineral acid, wherein cellulose is irradiated in the presence of mineral acid and a solution of styrene in a solvent selected from a specified group capable of swelling the cellulose to enable the styrene to gain access to active sites on the cellulose. Irradiation is carried out at a dose rate and with concentrations of styrene in the solvent and mineral acid which together produce a maximum amount of grafting for a given dose rate.

3,748,242
PREPARATION OF CYCLOBUTANONES FROM GLUTARIC ANHYDRIDES

Hiroyuki Hiraoka, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed June 12, 1972, Ser. No. 261,879
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 R **8 Claims**

The preparation of cyclobutanones from glutaric anhydrides by means of photolysis at a temperature of from about 120 to about 300° C.

3,748,243
PROCESS FOR THE PRODUCTION OF 1,1,1-TRICHLOROETHANE

Bernard Christiaens and Guy Martens, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

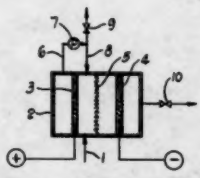
Filed June 7, 1971, Ser. No. 150,361
Claims priority, application Belgium, June 8, 1970, 90,049; Nov. 19, 1970, 96,503
Int. Cl. B01j *1/10;* **C07c** *17/00*
U.S. Cl. 204—163 R **6 Claims**

A process for the photochlorination of gaseous 1,1-dichloroethane to 1,1,1-trichloroethane, characterized in that the reaction is carried out at temperatures between 60 and 150° C. at a molar ratio, chlorine-to-1,1-dichloroethane, of between 1 and 4 and a residence time of the reagents in the reactor of between $\frac{1}{60}n$ and $\frac{1}{2500}n$, n being equal to the square root of the luminous intensity absorbed by the chlorine, expressed in Einstein·1^{-1}·sec.$^{-1}$.

3,748,244
PROCESS AND APPARATUS FOR ELECTRIC CELL TREATMENT OF LIQUOR

Allan Boyd Earl Gilchrist, Westlake, Ohio, assignor to SCM Corporation, Cleveland, Ohio

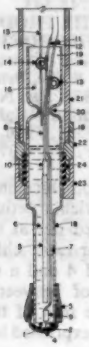
Continuation-in-part of application Ser. No. 166,436, July 27, 1971, now Patent No. 3,679,565, which is a continuation-in-part of abandoned applications Ser. No. 76,311, Sept. 28, 1970, Ser. No. 91,905, Nov. 23, 1970, and Ser. No. 94,267, Dec. 2, 1970. This application July 25, 1972, Ser. No. 274,850
Int. Cl. B01k *5/00;* **B01d** *13/02*
U.S. Cl. 204—180 R **7 Claims**



Liquor containing electrocoating paint or dispersed binder therefor can be processed for separation of components in a cell by the improvement which comprises maintaining opposed electrodes therein supplied with D.C. current flow at a current density in excess of that which will initiate electrodeposition on one of the electrodes under substantially quiescent cell conditions; these electrodes are grossly porous, e.g., pads of metal turnings, and interposed between them is an electrically nonconductive turbulence arrester, also grossly permeable to said liquor; the electrode which is subject to electrodeposition is supplied with a recirculating flow of liquor through it sufficiently high to maintain substantially unattenuated electric current flow between the electrodes; the cell preferably is fed between the turbulence arrester

and the deposition electrode; liquor enriched as to binder is withdrawn from a collection chamber communicating with the deposition electrode; liquor depleted in such binder is withdrawn from a chamber communicating with the opposite electrode. Apparatus for such process is shown.

3,748,245
ELECTROCHEMICAL DEVICE FOR CHEMICAL ANALYSIS
Conrad J. Feren and Robert W. Squires, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed June 21, 1972, Ser. No. 265,085
Int. Cl. G01n *27/30, 27/46, 27/48*
U.S. Cl. 204—195 P **9 Claims**

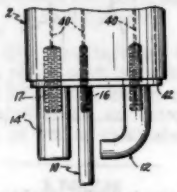


Improvement to an electrochemical device for chemical analysis comprising modification of said device to provide a high temperature heat sterilizable electrolytic cell adaptable for use with a high boiling electrolyte.

3,748,246
DIELECTRIC CIRCUIT FORMING PROCESS
James Emanuel Goell, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 8, 1971, Ser. No. 187,807
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **5 Claims**

There is disclosed a process for forming integrated optical circuit components on a substrate wafer in the form of dielectric thin films in patterns of high resolution and edge smoothness. For high resolution, the use of electron-resist and electron-beam exposure techniques are described. Particularly disclosed is the use of an aluminum mask formed over the circuit layer, the exposed portions of which are sputter etched away in an atmosphere that includes oxygen to preserve the aluminum mask. After the mask is chemically etched away, the resulting damage to the quality of the surface of the underlying circuit is restored by sputter etching the damaged surface. The use of films of silica and barium oxide in selected proportions that can be varied in different cases to achieve desired index relationships is facilitated by the cathode sputtering. Cathode sputtering, more than any known alternative, avoids the formation of microcrystallites in the film.

3,748,247
CORROSION PROBE ASSEMBLY
Aaron Weisstuch, Yardley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed Dec. 14, 1971, Ser. No. 207,887
Int. Cl. G01n *27/30*
U.S. Cl. 204—195 C **10 Claims**

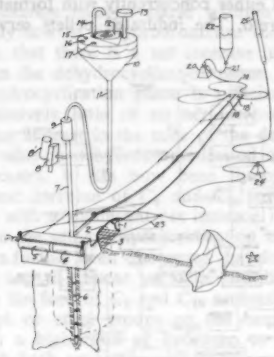


A corrosion probe assembly for measuring corrosion rates of metallic electrodes in corrodant electrolyte solutions. The probe is designed for simplicity of construction and serviceability, and comprises a reference electrode bent at substantially a right angle to bring it into close proximity with a test electrode. This electrode design permits a minimum solution IR drop in the corrodant electrolyte, and it allows accurate corrosion rate measurements in electrolytes of high resistivity.

3,748,248
DEEP SEA MINING SYSTEM
Frederick W. Wanzenberg and Fritz W. Wanzenberg, both of 9 Campbell Lane, Larchmont, N.Y.
Continuation-in-part of application Ser. No. 526,970, Feb. 10, 1966. This application Jan. 25, 1968, Ser. No. 700,470
Int. Cl. B01k *3/00*
U.S. Cl. 204—208 **35 Claims**

A system for recovering minerals, mineral ores and their compounds from the bottom of the sea and other deep water areas which employs a sled-like unit having a reaction chamber with an open bottom adapted to be dragged along the ocean floor while the reaction chamber is supplied with solvents and/or reagents which will react with the minerals and/or ores and other mineral bearing materials desired to be recovered and means associated with the reaction chamber for collecting the desired materials in more concentrated form and for bringing them to the surface which includes subjecting mixtures of the desired materials and waste to electrical deposition and/or chemical segregation. In one form of the apparatus employed the desired materials on the ocean floor are treated with chemical solvents and reagents which will react with the minerals and/or the com-

pounds sought and mixtures of the solution and reaction products with some waste forming material are brought



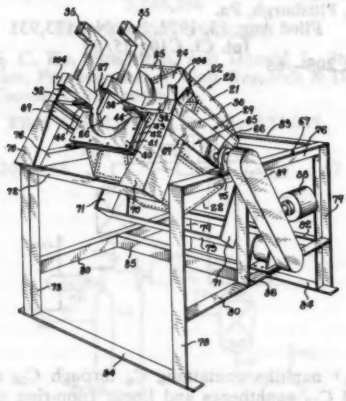
to the surface for extraction of the desired products by electrolytic deposition and segregation in a surface unit.

3,748,249

BARREL TYPE PROCESSING APPARATUS

James Barton, Grosse Point Woods, Mich., assignor to Ionic International Inc., Warren, Mich.

Filed Nov. 1, 1971, Ser. No. 194,260
Int. Cl. C23b *5/78*
U.S. Cl. 204—214 **35 Claims**



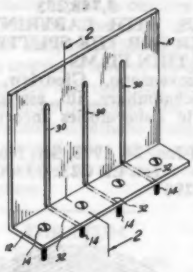
Barrel-type processing apparatus including a portable barrel unit for the processing of workpieces in bulk. A hollow, perforated rotatable barrel having a polygonal shaped side wall, front and rear end walls and an uncovered entrance opening in the front end wall is mounted on a frame. A supporting carriage is tiltably mounted on trunnions on another frame, and the barrel-mounting frame and barrel are supported on the supporting carriage. A reversible motor and drive mechanism are mounted on the frame which tiltably mounts the carriage, for tilting or swinging the carriage and hence the barrel to a barrel-loading position wherein the barrel entrance opening faces in a generally upward direction and to a barrel unloading position wherein the entrance opening faces in a generally downward direction. Retaining members secured to the carriage serve to retain the barrel-mounting frame and barrel on the barrel before, during and after the tilting movement of the carriage to and from the barrel loading and unloading positions while permitting the barrel-mounting frame and barrel to be lifted as a unit from the carriage by a manual or program-controlled hoist when desired. Horns or members secured to the barrel-mounting frame enable the lifting of such frame and the barrel as a unit from the supporting carriage by the hoist, and the transporting and lowering of such frame onto an upper edge portion of a processing tank so that the barrel is suspended at the upper portion of the tank and extends within the tank interior and is partially immersed in a treating or processing liquid in the tank. Retaining members secured to the tank serve to retain the barrel-mounting frame and barrel on the tank upper portion while permitting such frame and barrel to be lifted as a unit from the tank by the hoist, when desired.

3,748,250

DISTRIBUTION OF ELECTRIC CURRENT IN AN ELECTROLYTIC CELL ANODE

John E. Schmidt, Southgate, and Robert P. Metcalfe, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1971, Ser. No. 211,614
Int. Cl. B01k *3/10*
U.S. Cl. 204—266 **4 Claims**



In thin flat metal anodes a more uniform current distribution is obtained by cutting vertical slots in the anode either from the foot or through the foot of the anode and continuing upward for about 75 percent or more of the height of the anode blade, each segment thus prepared being supplied with bus bar connecting means. The vertical slots in the thin anode suppress horizontal current flow. Additionally, in the case wherein the thin flat anode is welded to the foot, the post weld distortion is relieved.

3,748,251

DUAL RISER FLUID CATALYTIC CRACKING WITH ZSM–5 ZEOLITE

Edward J. Demmel, Pitman, and Hartley Owen, Belle Mead, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,783
Int. Cl. C01b *33/28;* **C10g** *11/18*
U.S. Cl. 208—74 **30 Claims**

A method of cracking a hydrocarbon charge stock which comprises passing said charge stock into a reaction zone together with a catalyst composition comprising two cracking components, one of which is a zeolite component identified as a ZSM–5 type zeolite, withdrawing said catalyst composition from the reaction products, withdrawing hydrocarbon from the reaction zone, separating unreacted hydrocarbon charge and introducing unreacted hydrocarbon charge into a second reaction zone together with a catalyst composition comprising two cracking components one of which is a zeolite component identified as ZSM–5 type zeolite, withdrawing the reaction components and recovering liquid product.

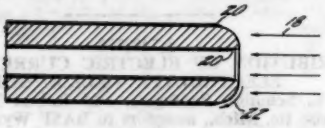
3,748,252

ELECTRODE FOR SMALL HOLE ELECTRO-CHEMICAL MACHINING

Frederick R. Joslin, Lebanon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 7, 1971, Ser. No. 187,492
Int. Cl. B01k *3/04*; B23p *1/02*
U.S. Cl. 204—284 8 Claims

An electrode for electrochemically machining small holes which has a particular configuration at the working end and has a dielectric coating, preferably a polymer which is evaporated from the operative end of electrode



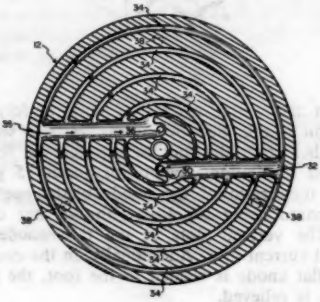
by a pulse or pulses of radiation thereby vaporizing the coating and producing a tapering end surface on the coating which blends with the surface of the tube.

3,748,253

APPARATUS WITH LABYRINTH HEAT EXCHANGER FOR THE SPUTTERING DEPOSITION OF THIN FILMS

Joseph C. Provenzano, Glenview, and Richard E. Govednik, Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 24, 1972, Ser. No. 220,242
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 7 Claims



Sputtering apparatus is improved by providing the cathode thereof with an integrally formed graded labyrinth heat exchanger through which a coolant is circulated to maintain the cathode and target material at a uniform temperature. Coolant parts and power input provisions are made such that the sputtering chamber may be hermetically sealed with a single seal.

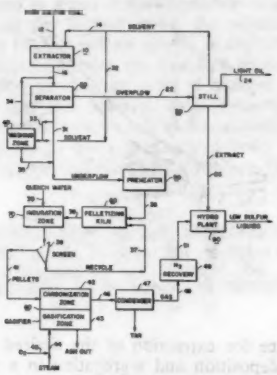
3,748,254

CONVERSION OF COAL BY SOLVENT EXTRACTION

Everett Gorin, Pittsburgh, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Dec. 8, 1971, Ser. No. 205,788
Int. Cl. C10g *1/00*
U.S. Cl. 208—8 15 Claims

Coal is partially converted by solvent extraction to a mixture of extract, solvent and undissolved carbonaceous residue. The mixture is separated into a low solids-containing fraction and a high solids-containing fraction. The composition of the latter is adjusted so that its admixture of solids and liquid binder (i.e. extract and solvent) is such as to make it pelletizable. Pellets are formed from the pelletizable composition, preferably in a rotary drum and indurated either concurrently with formation or subsequently thereto. The indurated pellets serve either as



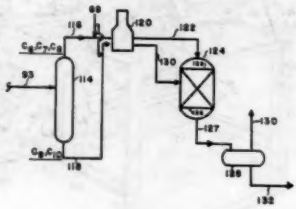
solid fuel or as a source of carbon in carbon-steam reactions.

3,748,255

TWO-STAGE DEHYDROCYCLIZATION PROCESS

Floyd L. Cassidy, Irwin, and Daniel Y. C. Ko, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 23, 1971, Ser. No. 173,931
Int. Cl. C10g *35/08*
U.S. Cl. 208—65 12 Claims



A C_5^+ naphtha containing C_6 through C_{10} and even C_{11} and C_{12} naphthenes and linear (non-ring structure) paraffins is reformed to improve its octane value by passage through one or a plurality of relatively high pressure acidic platinum catalyst naphthene aromatization reactors in series with one or more relatively lower pressure paraffin dehydrocyclization catalyst reactors. Most C_9 and C_{10} linear paraffins have an extremely low octane value (the octane number of normal decane is —53) and must generally be cracked to higher octane number fragments or to gases to achieve a gasoline product of satisfactory octane number. In the prior art this cracking generally occurred in the acidic platinum catalyst phase wherein the hydrogen pressure is high, protecting the catalyst from excessive coking. Cracking of the C_9 and C_{10} paraffins in the dehydrocyclization phase wherein the total pressure is lower in order to favor dehydrocyclization in addition to dehydrogenation would result in severe coking of catalyst. According to this invention C_9 and C_{10} linear paraffins are not hydrocracked but rather are dehydrocyclized. It has now been discovered that the dehydrocyclization phase must dehydrocyclize C_9 and C_{10} paraffins to C_9 and C_{10} aro-

matics if there is to be an increase in octane-barrel value in the dehydrocyclization phase. According to the present process, the C_9 and C_{10} paraffins are not cracked in the high pressure phase but are charged to the low pressure dehydrocyclization catalyst phase wherein the pressure is sufficiently low to dehydroaromatize the C_9 and C_{10} paraffins so that there is a net increase in C_9 and C_{10} aromatics in the dehydrocyclization phase. The pressure in the dehydrocyclization phase is sufficiently low that there is relatively little or no net increase in C_6 and C_7 aromatics at least in the zone of the dehydrocyclization phase wherein dehydroaromatization of C_9 and C_{10} paraffins occurs. It has now been discovered that a significant net increase of C_9 and C_{10} aromatics is incompatible with a significant net increase in C_6 and C_7 aromatics in the same dehydrocyclization zone, and vice versa. It has further been discovered that dehydrocyclization of C_9 and C_{10} linear paraffins is enhanced by the presence in the feed of C_9 and C_{10} aromatics containing multi-methyl or ethyl groups on the benzene ring together with a high ratio of hydrogen to hydrocarbon, even though both aromatics and hydrogen are products of the reaction. Therefore, a variation in the process accomplishes dehydrocyclization of C_6 and C_7 linear paraffins in an upstream zone of the dehydrocyclization phase and utilizes the hydrogen and aromatics therein produced with or without hydrogen and aromatics produced in the high pressure naphthene aromatization phase to enhance dehydroaromatization of C_9 and C_{10} paraffins which are separately added to a downstream zone in the dehydrocyclization phase.

3,748,256

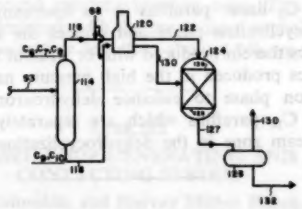
REFORMING PROCESS

Daniel Y. C. Ko, Pittsburgh, and Donald L. Stahlfeld, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 23, 1971, Ser. No. 173,829

Int. Cl. C10g *39/00*

U.S. Cl. 208—65 **17 Claims**



A C_5^+ naphtha containing C_6 through C_{10} and even C_{11} and C_{12} naphthenes and linear (non-ring structure) paraffins is reformed to improve its octane value by passage through one or a plurality of relatively high pressure acidic platinum catalyst naphthene aromatization reactors in series with one or more relatively lower pressure paraffin dehydrocyclization catalyst reactors. Most C_9 and C_{10} linear paraffins have an extremely low octane value (the octane number of normal decane is −53) and must generally be cracked to higher octane number fragments or to gases to achieve a gasoline product of satisfactory octane number. In the prior art this cracking generally occurred in the acidic platinum catalyst phase wherein the hydrogen pressure is high, protecting the catalyst from excessive coking. Cracking of the C_9 and C_{10} paraffins in the dehydrocyclization phase wherein the total pressure is lower in order to favor dehydrocyclization in addition to dehydrogenation would result in severe coking of catalyst. According to this invention C_9 and C_{10} linear paraffins are not hydrocracked but rather are dehydrocyclized. It has now been discovered that the dehydrocyclization phase must dehydrocyclize C_9 and C_{10} paraffins to C_9 and C_{10} aromatics if there is to be an increase in octane-barrel value in the dehydrocyclization phase. According to the present process, the C_9 and C_{10} paraffins are not cracked in the high pressure phase but are charged to the low pressure dehydrocyclization catalyst phase wherein the pressure is sufficiently low to dehydroaromatize the C_9 and C_{10} paraffins so that there is a net increase in C_9 and C_{10} aromatics in the dehydrocyclization phase. The pressure in the dehydrocyclization phase is sufficiently low that there is relatively little or no net increase in C_6 and C_7 aromatics at least in the zone of the dehydrocyclization phase wherein dehydroaromatization of C_9 and C_{10} paraffins occurs. It has now been discovered that a significant net increase of C_9 and C_{10} aromatics is incompatible with a significant net increase in C_6 and C_7 aromatics in the same dehydrocyclization zone, and vice versa. It has further been discovered that dehydrocyclization of C_9 and C_{10} linear paraffins is enhanced by the presence in the feed of C_9 and C_{10} aromatics containing multi-methyl or ethyl groups on the benzene ring together with a high ratio of hydrogen to hydrocarbon, even though both aromatics and hydrogen are products of the reaction. Therefore, a variation in the process accomplishes dehydrocyclization of C_6 and C_7 linear paraffins in an upstream zone of the dehydrocyclization phase and utilizes the hydrogen and aromatics therein produced with or without hydrogen and aromatics produced in the high pressure naphthene aromatization phase to enhance dehydroaromatization of C_9 and C_{10} paraffins which are separately added to a downstream zone in the dehydrocyclization phase.

ERRATUM

For Class 208—74 see:
Patent No. 3,748,251

3,748,257

HYDROCRACKING CATALYST AND PROCESS

Olaf A. Larson, O'Hara Township, Allegheny County, and Adam V. Vayda, Oakmont, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 818,111, Apr. 21, 1969. This application July 16, 1971, Ser. No. 163,427

Int. Cl. C10g *13/02, 23/02*

U.S. Cl. 208—111 **4 Claims**

A process for hydrocracking hydrocarbons carried out in the presence of a novel fluorine-promoted, tungsten sulfide hydrogenation catalyst prepared by impregnating a silica-alumina support with a water-soluble tungsten salt, calcining at 400° F. to 800° F. and then sulfiding with a gaseous sulfiding material.

3,748,258

DEHYDROCYCLIZATION OF PARAFFINS IN THE PRESENCE OF ADDED AROMATICS

Floyd L. Cassidy, Irwin, and Daniel Y. C. Ko, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

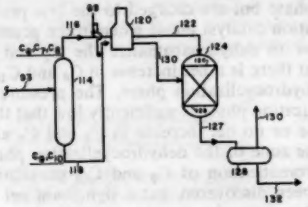
Filed Aug. 23, 1971, Ser. No. 174,052

Int. Cl. C10g *35/06*

U.S. Cl. 208—138 **12 Claims**

A C_5+ naphtha containing C_6 through C_{10} and even C_{11} and C_{12} naphthenes and linear (non-ring structure) paraffins is reformed to improve its octane value by passage through one or a plurality of relatively high pressure acidic platinum catalyst naphthene aromatization reactors in series with one or more relatively lower pressure paraffin dehydrocyclization catalyst reactors. Most C_9 and C_{10} linear paraffins have an extremely low octane

value (the octane number of normal decane is −53) and must generally be cracked to higher octane number fragments or to gases to achieve a gasoline product of satisfactory octane number. In the prior art this cracking generally occurred in the acidic platinum catalyst phase



wherein the hydrogen pressure is high, protecting the catalyst from excessive coking. Cracking of the C_9 and C_{10} paraffins in the dehydrocyclization phase wherein the total pressure is lower in order to favor dehydrocyclization in addition to dehydrogenation would result in severe coking of catalyst. According to this invention C_9 and C_{10} linear paraffins are not hydrocracked but rather are dehydrocyclized. It has now been discovered that the dehydrocyclization phase must dehydrocyclize C_9 and C_{10} paraffins to C_9 and C_{10} aromatics if there is to be an increase in octane-barrel value in the dehydrocyclization phase. According to the present process, the C_9 and C_{10} paraffins are not cracked in the high pressure phase but are charged to the low pressure dehydrocyclization catalyst phase wherein the pressure is sufficiently low to dehydroaromatize the C_9 and C_{10} paraffins so that there is a net increase in C_9 and C_{10} aromatics in the dehydrocyclization phase. The pressure in the dehydrocyclization phase is sufficiently low that there is relatively little or no net increase in C_6 and C_7 aromatics at least in the zone of the dehydrocyclization phase wherein dehydroaromatization of C_9 and C_{10} paraffins occurs. It has now been discovered that a significant net increase of C_9 and C_{10} aromatics is incompatible with a significant net increase in C_6 and C_7 aromatics in the same dehydrocyclization zone, and vice versa. It has further been discovered that dehydrocyclization of C_9 and C_{10} linear paraffins is enhanced by the presence in the feed of C_9 and C_{10} aromatics containing multi-methyl or ethyl groups on the benezne ring together with a high ratio of hydrogen to hydrocarbon, even though both aromatics and hydrogen are products of the reaction. Therefore, a variation in the process accomplishes dehydrocyclization of C_6 and C_7 linear paraffins in an upstream zone of the dehydrocyclization phase and utilizes the hydrogen and aromatics therein produced with or without hydrogen and aromatics produced in the high pressure naphthene aromatization phase to enhance dehydroaromatization of C_9 and C_{10} paraffins which are separately added to a downstream zone in the dehydrocyclization phase.

3,748,259

SELECTIVE DEHYDROCYCLIZATION PROCESS

Floyd L. Cassidy, Irwin, and Daniel Y. C. Ko, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 23, 1971, Ser. No. 174,014
Int. Cl. C10g *35/06*
U.S. Cl. 208—138 **14 Claims**

A C_5+ naphtha containing C_6 through C_{10} and even C_{11} and C_{12} naphthenes and linear (non-ring structure) paraffins is reformed to improve its octane value by passage through one or a plurality of relatively high pressure acidic platinum catalyst naphthene aromatization reactors in series with one or more relatively lower pressure paraffin dehydrocyclization catalyst reactors. Most C_9 and C_{10} linear paraffins have an extremely low octane value (the octane number of normal decane is −53) and must generally be cracked to higher octane number fragments or to gases to achieve a gasoline product of satisfactory octane number. In the prior art this cracking generally occurred in the acidic platinum catalyst phase wherein the hydrogen pressure is high, protecting the catalyst from excessive coking. Cracking of the C_9 and C_{10} paraffins in the dehydrocyclization phase wherein the total pressure is lower in order to favor dehydrocyclization in addition to dehydrogenation would result in severe coking of catalyst. According to this invention C_9 and C_{10} linear paraffins are not hydrocracked but rather are dehydrocyclized. It has now been discovered that the dehydrocyclization phase must dehydrocyclize C_9 and C_{10} paraffins to C_9 and C_{10} aromatics if there is to be an increase in octane-barrel value in the dehydrocyclization phase. According to the present process, the C_9 and C_{10} paraffins are not cracked in the high pressure phase but are charged to the low pressure dehydrocyclization catalyst phase wherein the pressure is sufficiently low to dehydroaromatize the C_9 and C_{10} paraffins so that there is a net increase in C_9 and C_{10} aromatics in the dehydrocyclization phase. The pressure in the dehydrocyclization phase is sufficiently low that there is relatively little or no net increase in C_6 and C_7 aromatics at least in the zone of the dehydrocyclization phase wherein dehydroaromatization of C_9 and C_{10} paraffins occurs. It has now been discovered that a significant net increase of C_9 and C_{10} aromatics is incompatible with a significant net increase in C_6 and C_7 aromatics in the same dehydrocyclization zone, and vice versa. It has further been discovered that dehydrocyclization of C_9 and C_{10} linear paraffins is enhanced by the presence in the feed of C_9 and C_{10} aromatics containing multi-methyl or ethyl groups on the benezne ring together with a high ratio of hydrogen to hydrocarbon, even though both aromatics and hydrogen are products of the reaction. Therefore, a variation in the process accomplishes dehydrocyclization of C_6 and C_7 linear paraffins in an upstream zone of the dehydrocyclization phase and utilizes the hydrogen and aromatics therein produced with or without hydrogen and aromatics produced in the high pressure naphthene aromatization phase to enhance dehydroaromatization of C_9 and C_{10} paraffins which are separately added to a downstream zone in the dehydrocyclization phase.

3,748,260

REFORMING A SULFUR-FREE GASOLINE FRACTION WITH A PLATINUM-GERMANIUM CATALYST

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. Nos. 828,762, May 28, 1969, Pat. No. 3,578,584, and Ser. No. 876,077, Nov. 12, 1969, abandoned. This application May 10, 1971, Ser. No. 141,980
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 **10 Claims**

A substantially sulfur-free gasoline fraction is catalytically reformed by contacting it and a substantially sulfur-free hydrogen stream with a substantially sulfur-free, bimetallic catalyst comprising a combination of a platinum group component, a germanium component and a halogen component with a porous carrier material, at reforming conditions. Key features of the disclosed process are: (1) use of substantially sulfur-free charge stock and hydrogen stream; (2) maintenance of substantially all of the platinum group component

of the bimetallic catalyst in the elemental state; (3) presence of substantially all of the germanium component of the bimetallic catalyst in an oxidation state above that of the elemental metal, and (4) maintenance of the bimetallic catalyst in a substantially sulfur-free state during the processing period.

3,748,261

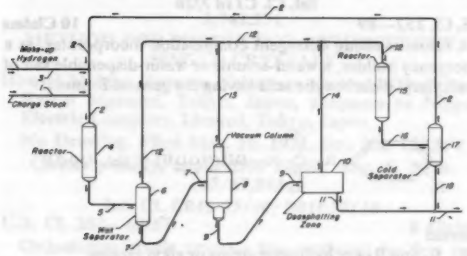
TWO-STAGE DESULFURIZATION WITH SOLVENT DEASPHALTING BETWEEN STAGES

Charles H. Watkins, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 14, 1971, Ser. No. 207,871

Int. Cl. C10g *31/14*

U.S. Cl. 208—210 **7 Claims**



An asphaltic, hydrocarbonaceous charge stock, containing more than about 2.0% by weight of sulfur, is converted to fuel oil in a plurality of catalytic conversion zones. The first zone effluent is separated to provide an asphaltene concentrate which is subjected to solvent deasphalting. The remainder of the first zone effluent, in admixture with the deasphalted product, is further reacted in a second catalytic reaction zone. The fuel oil product, in admixture with the precipitated asphaltics, has a sulfur concentration less than about 1.0% by weight.

3,748,262

CLOSED-LOOP GENERATING AND CONTACTING SYSTEM

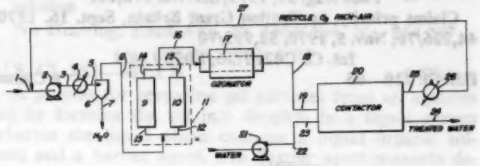
Hanju Lee, Columbia, and Harvey Milton Rosen, Laurel, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,503

Int. Cl. C02b *1/38*

U.S. Cl. 210—63 **18 Claims**

By this system, water can be treated with ozone in a closed loop cycle, thus conserving the high oxygen content gas used for ozone generation. The system comprises as a principal feature a pressure-swing fractionator which removes nitrogen, carbon dioxide and water vapor from a feed gas, producing an oxygen enriched gas which flows to an ozonator. On exit from the ozonator, the oxygen enriched gas contains from about 1 to 7 percent ozone. This gas mixture is then contacted with water to be treated. Purified water is recovered, and excess gas mixture, now at least partially depleted in ozone and oxygen and enriched in nitrogen, forms a recycle gas which is combined with a charge of air and flowed to the pressure-swing fractionator to begin another cycle. The pressure-swing fractionator serves the dual simultaneous purpose



of producing the necessary oxygen enriched gas for the ozonator and maintaining a low nitrogen level throughout the closed loop.

3,748,263

METHOD OF AND APPARATUS FOR MEASURING THE FILTER CAKE THICKNESS ON FILTER ELEMENTS OF SETTLING TANK FILTERS

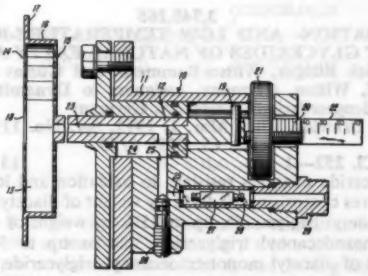
Lothar Stobe, Gutenberg, Germany, assignor to Seitz-Werke G.m.b.H., Bad Kreuznach, Germany

Filed July 9, 1971, Ser. No. 161,253

Claims priority, application Germany, July 10, 1970, P 20 34 308.2

Int. Cl. B01d *37/04*

U.S. Cl. 210—65 **7 Claims**



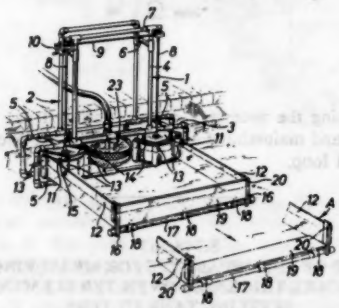
A method of measuring the thickness of a filter cake on a filter element of a settling tank filter, according to which a portion of the slurry introduced into the settling tank filter is in a continuous manner withdrawn therefrom in the form of a branched off stream and is passed through passage means in a filter body arranged opposite to and spaced from an adjacent filter element of the settling tank filter by a distance corresponding to the intended maximum thickness of the filter cake to be built up on the adjacent filter element. When the filter cake on the adjacent filter element has grown to its intended maximum thickness, it closes the passage means through the filter body while a filter layer settles on the filter body and filters the slurry of the branched off stream, the thus obtained filtrate being visible through a sight glass or the like and thus indicating to the operator that the filter cakes or the filter elements of the settling tank filter have reached their admissible maximum thickness.

3,748,264

METHOD AND APPARATUS FOR REMOVAL OF SURFACE LIQUIDS

Frederick Walter McCombie, London, England, assignor to Megator Pumps and Compressors Limited, London, England

Filed Aug. 31, 1971, Ser. No. 176,469
Claims priority, application Great Britain, Sept. 16, 1970, 44,226/70; Nov. 5, 1970, 52,799/70
Int. Cl. C02c *1/26*; E02b *15/04*
U.S. Cl. 210—65 6 Claims



Method and apparatus for pumping away floating oil slicks comprises a barrier capable of being extended to form an enclosure surrounding the slick. The enclosure is contracted to concentrate the slick which can then more easily be pumped away.

3,748,265

OXIDATION- AND LOW TEMPERATURE-RESISTANT GLYCERIDES OF NATURAL FATTY ACIDS

Heinrich Bünger, Witten-Bommern, and Gustav Renckhoff, Witten, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,828
Int. Cl. C09k *3/20*
U.S. Cl. 252—1 13 Claims

Glyceride mixtures resistant to oxidation and low temperatures comprising 10–99% by weight of diacetyl monododecanoyl triglyceride, up to 25% by weight of diacetyl monohexadecanoyl triglyceride, and/or up to 90% by weight of diacetyl monotetradecanoyl triglyceride, as well as optionally up to 10% by weight of an acetyl dialkanoyl triglyceride wherein the alkanoyl groups thereof have 12–16 carbon atoms.

3,748,266

METHODS AND COMPOSITIONS FOR REDUCING FRICTIONAL PRESSURE LOSS IN THE FLOW OF HYDROCARBON LIQUIDS

William T. Malone, Marlin D. Holtmyer, John M. Tinsley, and Jiten Chatterji, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

No Drawing. Continuation-in-part of abandoned application Ser. No. 878,578, Nov. 20, 1969. This application Nov. 1, 1971, Ser. No. 194,552
Int. Cl. F17d *1/14*; E21b *43/26*
U.S. Cl. 252—8.55 R 15 Claims

The present invention relates to methods and compositions for reducing the frictional pressure loss encountered in the turbulent flow of hydrocarbon liquids through a conduit. By the present invention a frictional pressure loss additive is intermixed with the hydrocarbon liquid, the additive being a homopolymer or a copolymer of the monomer

or copolymers of such monomer and certain styrene, acrylate or methacrylate type monomers.

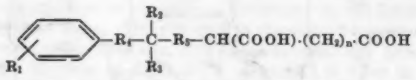
3,748,267

DETERGENT COMPOSITIONS

David Howard Stokes, Carmarthen, Wales, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 17, 1971, Ser. No. 172,566
Claims priority, application Great Britain, Aug. 20, 1970, 40,201/70
Int. Cl. C11d *7/26*
U.S. Cl. 252—89 10 Claims

A fabric-washing detergent composition incorporates, as a detergency builder, a water-soluble or water-dispersible salt of an alkylaryl dicarboxylic acid having the general formula:

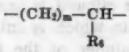


wherein

R_1, R_2 and R_3 are hydrogen atoms or alkyl groups;

R_4 is an alkylene chain containing from zero to eight carbon atoms and optionally incorporating in the chain other atoms as linking groups, such as —O—, —S—, —SO— and —SO_2—;

R_5 is a group similar to R_4 or is a group having the general formula:



wherein

R_6 is an alkyl group and m is 0 or 1; n is 0 or 1; and

the total number of carbon atoms in R_1, R_2, R_3, R_4 and R_5 is from six to 30.

3,748,268

SPOT AND STAIN REMOVING COMPOSITION

Basil L. Loudas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 123,080, Mar. 10, 1971. This application Mar. 27, 1972, Ser. No. 238,475
Int. Cl. C11d *7/52*
U.S. Cl. 252—90 17 Claims

A stable, one-phase composition which is useful as a spot and stain remover comprising a hydrocarbon solvent of low volatility, water, surfactant, organic co-solvent and anti-soiling agent.

3,748,269

POLYPHENYL THIOETHER LUBRICATING COMPOSITIONS

Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,969
The portion of the term of the patent subsequent to July 18, 1989, has been disclaimed
Int. Cl. C10m *1/48*
U.S. Cl. 252—46.6 5 Claims

Lubricating compositions comprising polyphenyl thioethers, polyphenyl ethers-thioethers or mixtures thereof

and containing small amounts of a polar organic compound and an organic phosphinic acid or ester have improved lubricating properties. These compositions are useful as lubricants over wide temperature ranges.

3,748,270

METHOD OF PREPARING COBALT DOPED MAGNETIC IRON OXIDE PARTICLES

Paul Y. Hwang, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,155

Int. Cl. C01g *49/06;* C04b *35/00*

U.S. Cl. 252—62.56 6 Claims

High coercivity cobalt doped magnetic iron oxide particles are made by doping an iron oxide with cobalt, converting the material to a cobalt doped gamma ferric oxide containing a small amount of divalent iron at a high temperature and slow cooling the hot material in an inert atmosphere.

3,748,271

METHOD FOR PRODUCING ORTHOFERRITE SINGLE CRYSTALS

Hiroshi Makino, Susumu Nakamura, Takashi Okada, and Koichi Matsumi, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

No Drawing. Filed Mar. 31, 1971, Ser. No. 129,952

Claims priority, application Japan, Aug. 5, 1970, 45/67,983

Int. Cl. C04b *35/40;* B01j *17/18*

U.S. Cl. 252—62.57 6 Claims

Orthoferrite single crystals are produced by first producing an orthoferrite polycrystalline body having an Fe_2O_3 content ranging from about 49.8 mol percent to 50.4 mol percent and then subjecting said body to a floating-zone method in oxygen at a pressure ranging from 1 to 10 atmospheres.

3,748,272

DESICCANTS WITH MOISTURE INDICATOR

Adolf Wenz, Karlheinz, Neissius, and Alois Litters, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed Sept. 11, 1970, Ser. No. 71,374

Claims priority, application Germany, Sept. 12, 1969, P 19 46 277.2

Int. Cl. C09k *3/00*

U.S. Cl. 252—194 6 Claims

Desiccant compositions containing as a desiccant concentrated sulfuric acid or phosphorus pentoxide, in admixture with a solid carrier and a dyestuff which exhibts a different color in the presence of hydrated desiccant, e.g., 1-hydroxy-4-(2-sulfo - 4,6 - dinitrophenylazo)-naphthalene when sulfuric acid is employed as desiccant and neutral red when phosphorus pentoxide is employed.

3,748,273

PREPARATION OF SOLS BY HYDROGEN REDUCTION OF NITRATE SOLUTIONS

Jean G. Smith, Baltimore, Md., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed May 4, 1971, Ser. No. 140,281

Int. Cl. C01g *43/02*

U.S. Cl. 252—301.1 S 5 Claims

A process for converting metal nitrate solution into colloidal oxides by exposing the solution to hydrogen under pressure with vigorous stirring in the presence of a hydrogenation catalyst.

3,748,274

METHOD OF MAKING PARTICLES FROM AN AQUEOUS SOL

Gordon W. Rankin and James R. Hooker, San Diego, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Aug. 29, 1969, Ser. No. 854,287

Int. Cl. C09k *3/08*

U.S. Cl. 252—301.1 S 6 Claims

A process for preparing gel particles from an aqueous sol by forming the sol into droplets in a liquid system wherein the liquid phase contains a liquid organic solvent and a barrier agent. The barrier agent prevents dehydration from occurring too rapidly and permits surface tension effects to form sol droplets into the desired spheroidal shape. A preferred barrier agent is mineral oil.

3,748,275

PROCESS FOR PRODUCING EMULSIONS OF ORGANOPOLYSILOXANES

Willy Bernheim, Diedorf, near Augsburg, and Hans Deiner, Neusass, near Augsburg, Germany, assignors to Chemische Fabrik Pfersee GmbH, Augsburg, Germany

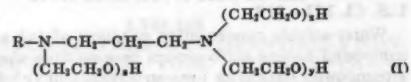
No Drawing. Filed June 10, 1971, Ser. No. 151,939

Claims priority, application Germany, June 30, 1970, P 20 32 381.3

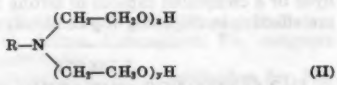
Int. Cl. B01j *13/00*

U.S. Cl. 252—312 9 Claims

A process for producing emulsions of organopolysiloxanes which contain hydrogen atoms bound to silicon and which are suitable for hydrophobing fibrous materials of all types, whereby polyoxyethylene compounds are used as emulsifiers, is characterized by the use as emulsifiers of polyoxyethylene alklamines of the general formula



(I)



(II)

wherein R is an aliphatic saturated or unsaturated alkyl residue with at least 12 C-atoms, *x*, *y* and *z* are the same or different numbers greater than 1, and having an HLB number of 9 to 18, or their salts with low molecular organic acids or mineral acids.

3,748,276

AQUEOUS GEL COMPOSITION CONTAINING POLYETHER POLYOL GELLING AGENTS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 845,510, July 28, 1969. This application July 19, 1971, Ser. No. 163,989

Int. Cl. B01j *13/00*

U.S. Cl. 252—316 5 Claims

Aqueous gel compositions for use in pharmaceutical and cosmetic applications are prepared employing polyether polyols as gelling agents. These polyether polyols are prepared by the copolymerization of low molecular weight alkylene oxides and α-olefin oxides containing from 14 to 20 carbon atoms with low molecular weight active hydrogen-containing compounds.

3,748,277

PROCESS OF FORMING MINUTE CAPSULES

John G. Wagner, Kalamazoo, Mich., assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 781,918, Dec. 22, 1958. This application Oct. 14, 1965, Ser. No. 496,133

Int. Cl. B01j *13/02*; B44d *1/02*

U.S. Cl. 252—316 24 Claims

A process for forming minute capsules in a manufacturing vehicle which comprises (a) establishing an agitated system consisting of a liquid vehicle constituting a major portion of said system by volume and forming a continuous liquid first phase, a second phase dispersed in said liquid vehicle consisting of minute, mobile entities of core material, and a third phase dispersed in said liquid vehicle consisting of minute, mobile, non-aqueous, liquid entities of a wall-forming solution of a polymeric material having a viscosity such that said solution of wall-forming polymeric material maintains itself about the core material in the agitated system, the said core material being wettable by said wall-forming solution and the said three phases being mutually incompatible, whereby said wall-forming solution deposits on and around said core entities to form a continuous liquid protective wall, and (b) subsequently hardening the walls so formed.

3,748,278

PROCESS AND AGENTS HAVING AN INFLUENCE ON THE WEATHER

Rudolf Kühne, Frankfurt am Main, Helmut Diery, Kelkheim, Taunus, and Siegbert Rittner, Frankfurt am Main, Germany, asssignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 31, 1971, Ser. No. 176,696

Claims priority, application Germany, Sept. 2, 1970, P 20 43 497.3

Int. Cl. B01d *17/00*; E01h *13/00*

U.S. Cl. 252—319 5 Claims

Water-soluble condensation products of (a) a phenolic compound having sulfo groups or a mixture thereof, (b) a compound having an urea structure, and (c) formaldehyde or a compound capable of setting free formaldehyde are effective in dispelling fog or clouds or causing rain.

3,748,279

CATALYSTS FOR PREPARING POLYCYCLIC UNSATURATED HYDROCARBONS

Alberto Greco, Antonio Carbonaro, and Geno Dall Asta, Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

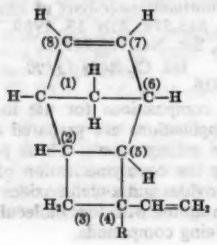
No Drawing. Original application May 11, 1970, Ser. No. 36,444, now Patent No. 3,661,869. Divided and this application July 2, 1971, Ser. No. 159,540

Claims priority, application Italy, May 12, 1969, 16,717/69

Int. Cl. C07c *13/54*

U.S. Cl. 252—429 B 3 Claims

New doubly unsaturated polycyclic hydrocarbons having the general Formula I:



(I)

in which R is H or CH_3, are disclosed. Polycyclic unsaturated hydrocarbons included in Formula I are 4-vinyltricyclo[4,2,1,$0^{2,5}$]nona-7-ene and 4-methyl-4-vinyl tricyclo[4,2,1,$0^{2,5}$]nona-7-ene. The new polycyclic hydrocarbons having two types of unsaturation are addition products, or hetero-dimers, of bicyclo [2,2,1] hepta-2,5-diene(2,5-norbornadiene) and a conjugated aliphatic diene, such as butadiene-1,3 or isoprene, and are obtained by reacting the monomers in the presence of particular catalysts comprising zero-bis- or trivalent iron compounds, an alkyl magnesium halide and an ether.

3,748,280

NICKEL-CALCIUM ALUMINATE-BARIUM SALT CATALYST

William G. Billings, and William T. Nelson, both of c/o Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 38,522, May 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 647,935, June 22, 1967, Pat. No. 3,522,024, which is a continuation-in-part of Ser. No. 553,299, May 27, 1966, abandoned. This application Oct. 28, 1971, Ser. No. 193,575

Int. Cl. C10g *11/02*, *11/04*, *11/28*

U.S. Cl. 252—430 8 Claims

A physically durable catalyst composition having high and long-lived catalytic activity comprising calcium aluminate and nickel promoted with a barium salt of an organic acid is provided. The catalyst is preferably prepared by impregnating the calcium aluminate support with a nickel salt, reducing the nickel salt-impregnated calcium aluminate and then adding the barium salt, followed by drying prior to use. The catalyst has utility in the steam reforming of hydrocarbons to produce gaseous products rich in methane, fungible with natural gas.

3,748,281

PROCESS FOR THE PREPARATION OF HEXACHLOROCYCLOPENTADIENE

Kenneth K. Aoki, Trenton, and Arnold L. McMaster, Lincoln Park, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Original application Mar. 17, 1969, Ser. No. 807,913, now Patent No. 3,649,699. Divided and this application Aug. 25. 1971, Ser. No. 174,969

Int. Cl. B01j *11/78*

U.S. Cl. 252—441 2 Claims

A process for producing hexachlorocyclopentadiene (HCCP) in a single stage thermal chlorination reaction wherein n-pentane and chlorine are reacted at 275–400° C. in the presence of a catalyst comprising porous alumina having a low surface area of from about 0.4 $m.^2/g.$ to about 30 $m.^2/g.$ and can contain specified metal chlorides. This process is also suitable for producing HCCP from chlorine and other C_5 hydrocarbons.

3,748,282

PRODUCTION OF SHAPED MAGNESIUM OXIDE COMPOSITIONS

Robert D. Evans, Hackensack, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,460

Int. Cl. B01j *11/06*, *11/32*

U.S. Cl. 252—471 9 Claims

Shaped magnesium oxide compositions having a good balance of properties including catalytic activity may be produced by slaking a quantity of magnesium oxide in an aqueous solution of a water miscible volatile organic compound, drying the slaked mixture to a specified wetness, granulating and compacting the dried mixture into a desired shape and calcining the shaped mixture to convert a portion of the magnesium hydroxide formed during slaking to magnesium oxide.

3,748,283
METHOD FOR DISPERSING Cr^{3+} IONS IMPREGNATED IN SILICA

Donald E. O'Reilly, Downers Grove, Ill., and James E. Salamony, Cannon Air Force Base, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 3, 1972, Ser. No. 215,159
Int. Cl. B01j 11/40
U.S. Cl. 252—455 R 8 Claims

A method for producing delta-phase Cr^{3+} ions impregnated in silica or silica-alumina comprising forming a solution of oxalic acid and chromium nitrate, impregnating the silica or silica-alumina with this solution, heating and oxidizing the impregnated material so as to decompose the nitrate and oxalic acid respectively, and reducing the heated impregnated material to form Cr^{3+} ions.

3,748,284
PERFUMES INCLUDING PERHYDRO 1,4,9,9-TETRAMETHYL-4,7-METHANOAZULENONES

James D. Crossman, Old Bridge, Braja D. Mookherjee, Matawan, Robert S. de Simone, Madison Township, County of Middlesex, and Ernest T. Theimer, Rumson, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Original application June 10, 1968, Ser. No. 735,544, now Patent No. 3,679,749. Divided and this application Nov. 26, 1971, Ser. No. 202,598
Int. Cl. A61k 7/00; C07c 49/27; C11b 9/00
U.S. Cl. 252—522 3 Claims

Perhydro 1,4,9,9-tetramethyl - 4,7 - methanoazulenones useful as olfactory agents; and perfume compositions containing such azulenones.

3,748,285
COMPOSITION AND PROCESS FOR CLEANING ION EXCHANGE RESINS

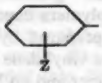
Donald G. Wiltsey, Park Forest, Alfred W. Oberhofer, Alsip, Richard E. Bloemke, River Grove, and Arnold Karklins, Chicago, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 19,469, Mar. 13, 1970. This application June 26, 1972, Ser. No. 266,034
Int. Cl. C11d 3/065
U.S. Cl. 252—531 3 Claims

A composition useful for cleaning ion exchange resin beds, comprising: (a) from 60 to 90% by weight of water; (b) from 0.5 to 4% of an unsubstituted, liquid aliphatic hydrocarbons having from 5 to 10 carbon atoms in chain length; (c) from 0 to 10.0% of a wetting agent selected from the group consisting of sulfated alcohols and sulfonated hydrocarbons and having from 6 to 22 carbon atoms in chain length; (d) from 5.0 to 15.0% of an organic compound having the formula

$$R(OCH_2CH_2)_xOR$$

where R is independently selected from the group consisting of H, lower aliphatic radical of from 1 to 6 carbon atoms and radicals having the formula:



where Z is selected from the group consisting of H and aliphatic hydrocarbon radicals of from 4 to 18 carbon atoms, and x is an integer of from 1 to 20; and (e) from 1 to 15% of an alkali inorganic phosphate, is disclosed. A process for using this composition is also disclosed.

3,748,286
PROCESS FOR POLYMERIZING ISOBUTYLENE OXIDE

Atsushi Tanaka, Tokyo, and Hideo Sawada, Hirotaka Toba, Masahiko Kusumoto, and Kozi Sato, Saitama, Japan, assignors to Daicel Ltd., Higashi-ku, Osaka, Japan

No Drawing. Filed Dec. 10, 1970, Ser. No. 96,973
Claims priority, application Japan, Dec. 15, 1969, 44/100,761
Int. Cl. C08g 23/14
U.S. Cl. 260—2 A 6 Claims

High molecular weight polymers of isobutylene oxide are prepared by polymerizing isobutylene oxide in the presence of a novel ternary component catalyst consisting of an organozinc compound, water and a sulfur containing compound.

3,748,287
PROCESS FOR PREPARING MICROPOROUS CELLULAR POLYMERIC STRUCTURES

Kung Hsing Lee, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,172
Int. Cl. B29d 27/04
U.S. Cl. 260—2.5 AY 6 Claims

A process for preparing microporous cellular polymeric structures which comprises (a) dissolving the starting polymer in a non-aqueous solvent; (b) adding thereto a chlorofluorocarbon to form a dispersion of polymer in solvent; (c) forming said polymer dispersion into a regular continuous structure; (d) removing the solvent from the polymer dispersion structure; and (e) removing the chlorofluorocarbon from the structure.

3,748,288
PROCESS FOR PREPARING SUBSTANTIALLY NONLUSTROUS OPEN PORE POLYURETHANE FOAMS IN SITU AND FOAM PREPARED THEREBY

Joseph Winkler and Charles W. Bredbenner, Hazleton, and Lawrence G. Adlum, Conyngham, Pa., assignors to Tenneco Chemicals Inc.

No Drawing. Continuation-in-part of application Ser. No. 121,593, Mar. 5, 1971. This application Dec. 27, 1971, Ser. No. 212,665
Int. Cl. C08g 22/44
U.S. Cl. 260—2.5 AH 28 Claims

This invention provides a substantially nonlustrous, highly open polyester-type urethane foam by the addition of a minor proportion of a conventional polyether polyol reagent and a small amount of a hydrophobic, antifoaming organo-silicon compound. Preferably, a polyether-polyol type foam-stabilizing organo-silicon emulsifier is added. Pigments and other conventional additives can also be added if desired.

3,748,289
CARBODIIMIDE FOAMS OF REDUCED FRIABILITY PREPARED IN THE PRESENCE OF AN ACRYLONITRILE-GRAFTED POLYOL

Moses Cenker, Trenton, Peter T. Kan, Livonia, John T. Patton, Jr., Wyandotte, and Earl J. Robertson, Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,910
Int. Cl. C08g 22/46, 22/08
U.S. Cl. 260—2.5 BF 6 Claims

Rigid cellular foams characterized by carbodiimide linkages and of reduced friability are prepared by the cata-

lytic condensation of an organic polyisocyanate and in the presence of an acrylonitrile-grafted polyol.

3,748,290

PLASTER MOLD COMPOSITIONS

Werner Reingen, Pfaffenberg, Germany, assignor to Suddeutsche Kalkstickstoffwerke Aktiengesellschaft, Trostberg, Upper Bavaria, and H & E Borgordts, fractional part interest to each

No Drawing. Continuation-in-part of application Ser. No. 869,887, Oct. 27, 1969. This appplication Feb. 28, 1972, Ser. No. 230,094

Claims priority, application Germany, Oct. 25, 1968, P 18 05 126.8

Int. Cl. C08g *37/30*

U.S. Cl. 260—2.5 F 13 Claims

A composition for the manufacture of patterns and molds, particularly ceramic molds comprising two principal constituents:

(a) a mixture comprising an α- and/or β-semihydrate of gypsum; sodium potassium tartrate to reduce expansion and; calcium hydrogen phosphate to promote hardening and capillarity; and

(b) a modified melamine formaldehyde resin, e.g., a melamine formaldehyde resin having at least one or more amino groups substituted by a sulfite or sulfonic-acid group. Conventional retarders, accelerators and a second hardening agent such as finely-ground anhydrous aluminum sulfate may be present in the mixture. The composition has reduced expansion on setting while having increased strength, lifetime, excellent capillarity and gas permeability.

3,748,291

POLYURETHANE TIRE YARN FINISH ADDITIVE

Roop S. Bhakuni, Copley, and Joseph L. Cormany, Jr., Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 78,251, Oct. 5, 1970. This application Oct. 29, 1971, Ser. No. 194,044

Int. Cl. C08g *51/22*

U.S. Cl. 260—18 TN 1 Claim

Polyurethane alone or in combination with epoxides or in combination with melamine/formaldehyde resins as adhesion promoting agents are added to the finish or spinning composition applied to tire yarn used in making tire reinforcing cord as a means of promoting adhesion between the cord and the rubber when using a conventional R/F/L adhesive.

3,748,292

CORROSION RESISTANT PRIMER COATING FOR ALUMINUM SURFACES CONTAINING STRONTIUM CHROMATE AND MAGNESIUM POWDER

Arthur Stander, Jenkintown, Pa., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Jan. 18, 1972, Ser. No. 218,818

Int. Cl. C08g *51/02*

U.S. Cl. 260—18 PN 1 Claim

The present invention relates to a unique aircraft primer composition which provides improved corrosion protection under prolonged exposure to severe salt and water environments. The primer composition consists of strontium chromate and finely divided magnesium powder in a vehicle consisting of a condensation product of epichlorohydrin and Bisphenol A having an average molecular weight of 900 and a polyamide resin having an amide value of 210–240, a viscosity of 500–750 poises at 40° C. and a specific gravity of 0.99.

3,748,293

PROCESS FOR PREPARING ALKYD-ACRYLIC GRAFT COPOLYMERS

John A. Torelli, Long Island City, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 18, 1971, Ser. No. 144,640

Int. Cl. C08g *17/10, 39/10*

U.S. Cl. 260—21 12 Claims

The novel process of this invention is directed to the preparation of graft copolymers having an alkyd resin backbone and side chains of polymerized ethylenically unsaturated monomers and comprises the following steps:

(1) Blending an alkyd resin having reactive hydroxy groups with side chain monomers of a hydroxy-containing acrylic monomer and other ethylenically unsaturated monomers such as styrene, alkyl methacrylate, alkyl acrylate, acrylonitrile, methacrylonitrile or mixtures of these monomers and a polymerization catalyst;

(2) reacting the mixture of about 2–15 hours and

(3) adding a melamine resin or a urea/formaldehyde resin and an acid catalyst to the reaction mixture and continuing the polymerization reaction to form the graft copolymer.

3,748,294

LIQUID COMPOSITIONS COMPRISING GELLED URETHANE POLYMER

Robert William Kershaw, South Blackburn, and Livia Polgar, Caulfield, Victoria, Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,411

Int. Cl. C08g *22/08;* C09d *3/72*

U.S. Cl. 260—22 TN 12 Claims

A process is disclosed whereby liquid, self-stabilized gels of urethane polymer free of visible gel particles, in an inert organic liquid are prepared from polyisocyanate and polyhydroxy reactants which would otherwise co-react to form visible gels. The liquids are useful per se for the manufacture of surface coatings and blends thereof with conventional coatings compositions, especially of the air-drying alkyd resin type, enhance through-drying rates and retard wrinkling.

3,748,295

LOW-TEMPERATURE CURING POLYMERS AND LATICES THEREOF

Bela K. Mikofalvy, Sheffield Lake, and Donald P. Knechtges, Middleburg Heights, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Original application June 10, 1970, Ser. No. 45,208, now Patent No. 3,682,871, dated Aug. 8, 1972. Divided and this application Jan. 10, 1972, Ser. No. 216,819

Int. Cl. C08f *29/54, 33/02, 29/18*

U.S. Cl. 260—29.6 TA 8 Claims

Vinylidene halide polymers capable of being cured at low temperatures are prepared by the emulsion polymerization of one or more vinylidene halide monomers with a carboxylic acid monomer and an N-alkylol amide monomer in an aqueous system. The resulting polymers develop optimum or near optimum physical properties upon curing at room temperature or at temperatures up to about 225° F.

3,748,296

USE OF SULFONAMIDE DERIVATIVES HAVING OXYGEN-CONTAINING END GROUPS AS MODIFYING AGENTS AND/OR PIGMENT GRINDING AGENTS FOR THE MANUFACTURE OF MOLDED POLYURETHANE ARTICLES AND POLYURETHANE VARNISHES

Guenter Balbach, Weidach, and Guenther Reinert, Uhingen, Germany, assignors to Dr. Th. Bohme KG. Chem. Fabrik, Gartenberg, Germany

No Drawing. Filed Oct. 12, 1971, Ser. No. 187,899
Claims priority, application Germany, Oct. 10, 1970, P 20 49 802.6
Int. Cl. C08f *51/46*
U.S. Cl. 260—308 R 9 Claims

A class of sulfonamide compounds are disclosed which have compatibility with polyurethane resins. The sulfonamides are useful as antistatic agents and plasticizers for polyurethane resins. These particular sulfonamide compounds are also useful as processing aids in the dyeing of polyurethane resins.

3,748,297

POLYCHLOROPRENE GASKET-FORMING COMPOSITIONS CONTAINING AS A RHEOLOGY-AFFECTING ADDITIVE, 2-MERCAPTOBENZOTHIAZOLE

Joel A. Gribens, Framingham, and Anthony D. Giannetto, North Reading, Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,638
Int. Cl. C08c *11/36*
U.S. Cl. 260—31.8 DR 3 Claims

ABSTRACT OF THE DISCLOSURE

Polychloroprene compounds of high rubber concentration, both on a wet and dry basis, can be successfully lined as gaskets into aerosol mounting cups if they contain between about 1.25 and 4 parts by weight per hundred parts rubber of 2-mercaptobenzothiazole.

3,748,298

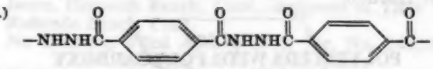
AROMATIC-OXALIC POLYHYDRAZIDES AND SOLUTIONS THEREOF

Frank Dobinson, Gulf Breeze, and Chris A. Pelezo, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 29, 1971, Ser. No. 184,911
Int. Cl. C08g *33/04, 51/44*
U.S. Cl. 260—32.6 NA 8 Claims

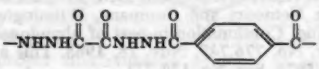
Film- and fiber-forming solutions of high-molecular-weight, linear polyhydrazides dissolved in N,N-dimethyl acetamide solvent containing dissolved inorganic halide are provided. The polyhydrazides contain recurring structural units:

(A)



and

(B)



in a ratio between 1:9 and 9:1 and are prepared in dimethyl acetamide containing dissolved, e.g., lithium chloride by polymerizing therein appropriate amounts of reactants which include terephthaloyl chloride, terephthalic dihydrazide and oxalic dihydrazide. The resulting solutions may be extruded into fibers or cast into films by conventional solution spinning and casting. Fibers produced from these solutions have very high values of tensile strength and modulus, and are particularly useful in reinforcing rubber and plastic articles.

3,748,299

DOPES OF POLY(p-PHENYLENE TEREPHTHALAMIDE) IN ORGANOPHOSPHORUS SOLVENTS

Michael Theodore Waroblak, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 26, 1972, Ser. No. 277,277
Int. Cl. C08g *51/44, 51/46, 51/50*
U.S. Cl. 260—32.6 NA 3 Claims

Spinning dopes of poly(p-phenylene terephthalamide) in combinations of selected organophosphorus compound and lithium chloride are provided.

3,748,300

POLYHYDROXYSILICATE-POLYMER REACTION PRODUCT

Jean-Marc Lalancette, Sherbrooke, Quebec, Canada, assignor to Universite de Sherbrooke, Quebec, Canada

No Drawing. Filed July 2, 1971, Ser. No. 159,476
Int. Cl. C08g *51/04*
U.S. Cl. 260—38 20 Claims

A new compound is provided which is the reaction product of a finely divided polyhydroxysilicate and a hydroxy-containing polymer such as phenol-formaldehyde, an epoxy resin or resorcinol-formaldehyde. The product can be molded and cured into any structural shape and provides highly interesting physical properties.

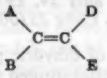
3,748,301

PROCESS FOR MAKING A FRICTION ELEMENT AND POLYMERIC COMPOSITION

George A. Kuhar, Greensburg, Wallace R. Miller, Uniontown, and Anthony F. Finelli, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 399,911, Sept. 28, 1964. This application Jan. 14, 1970, Ser. No. 4,177
Int. Cl. C08f *1/86, 45/04, 45/18*
U.S. Cl. 260—41 A 6 Claims

A composition having a specific gravity of about 1.2 to about 3 and a Rockwell R scale hardness of 40 to about 120, consisting essentially of a polymeric matrix having dispersed therein about 5 to 90% by weight of a mineral filler having a specific gravity greater than 1, the polymeric matrix comprising polymers of a liquid monomer selected from the class having the formula



where A, B, D and E are selected from the group consisting of hydrogen, methyl and higher alkyl radicals and the halogens, phenyl, vinyl phenyl, alkoxy, carboxyl, acetate and nitrile. The filler, in addition to being a mineral filler, can also contain an appreciable amount of organic filler of the elastomeric polymers and related polymers usually in a quantity sufficient to double the viscosity of the liquid monomer.

3,748,302

FLAME-RETARDED ACRYLONITRILE FIBERS

Edward Barry Jones, Waynesboro, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,765
Int. Cl. C08f *45/04*
U.S. Cl. 260—41 B 5 Claims

A flame-retardant fiber of an acrylonitrile copolymer that contains at least 10% by weight atoms of chlorine or bromine, said atoms being directly connected to carbon atoms of the copolymer; said copolymer having distributed throughout, finely divided particles of an oxide of antimony, in an amount of at least two percent by weight based on the weight of the copolymer, said particles being less than 500 A. in size; said copolymer also having distributed throughout, particles of a metallic oxide greater than 500 A. in size in an amount sufficient to deluster the

fiber but not more than 2.25% of the area of an electron micrograph of a cross-section of the fiber.

3,748,303
HALOGENATED BIPHENOL POLYESTERS AND POLYCARBONATES

Hans-Dieter Becker, Goteborg, Sweden, and Alfred R. Gilbert, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Original application July 9, 1970, Ser. No. 53,648. Divided and this application Jan. 28, 1972, Ser. No. 221,782
Int. Cl. C08g *17/06, 17/13*
U.S. Cl. 260—47 XA **7 Claims**

Halobiphenols can be produced from precursor diphenoquinones by effecting reaction between the diphenoquinone and a hydrogen halide, such as hydrogen chloride, while the diphenoquinone is suspended in a liquid medium of the class of water, lower alkanols and mixtures of water and said alkanols. The biphenols thus obtained can be used as antioxidants or as intermediates in the preparation of other diphenoquinones and polymeric compositions useful in the coating and insulating arts.

3,748,304
AMIDE-IMIDE COPOLYMERS

James R. Stephens, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation of abandoned application Ser. No. 79,678, Oct. 9, 1970. This application Mar. 28, 1972, Ser. No. 238,988
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP **12 Claims**

Novel copolymers of the amide-imide type are made from approximately equimolar amounts of a mixture of two or more largely- or wholly-aromatic primary diamines and an aromatic polycarboxylic-acid-anhydride derivative. These novel copolymers are useful for preparing enamels, films and molded articles of superior properties.

3,748,305
COPOLYMERS OF ACETYLENES AND PHENOLS

Dwain M. White, Schenectady, and Howard J. Klopfer, Rexford, N.Y., assignors to General Electric Company

No Drawing. Filed July 29, 1971, Ser. No. 167,477
Int. Cl. C08g *23/00, 23/16*
U.S. Cl. 260—47 UA **10 Claims**

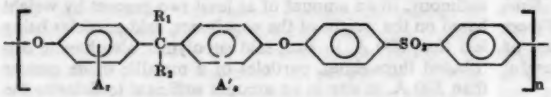
Dipropargyl ethers of dihydric phenols are readily copolymerized with 2,6-disubstituted phenols by an oxidative coupling process. Diacetylenic alkanes are borderline in their ability to be so copolymerized. Other diacetylenic compounds can be copolymerized providing the dipropargyl ether is also present. These copolymers are readily soluble in organic solvents and can therefore be used to produce coatings which are photosensitive and also can be thermally decomposed into carbon objects. The polymers are also useful as matrices for binding carbon fibers into fabricated articles.

3,748,306
PHOSPHORUS-CONTAINING THERMOPLASTIC POLY(ETHER-SULFONES)

Ghazi Khattab, Parsippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,187
Int. Cl. C08g *23/20, 33/16*
U.S. Cl. 260—49 **15 Claims**

Phosphorus-containing thermoplastic poly(ether-sulfone) condensation polymers having a backbone chain of the formula



wherein R_1 and R_2 are H, alkyl or phenyl, provided only one of R_1 and R_2 is H, A and A' are members selected from the group consisting of PCl_2, $—PCl_4$, $—P(OX)_2$ and $—PO(OX)_2$ wherein X is H or an alkali metal, n is an integer of at least 30, and r and s are 0 or 1, with the proviso that the ratio of

$$\frac{r+s}{n}$$

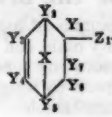
is between 0.2 and 2, have improved resistance to attack by solvents and to environmental stress-cracking, as compared to the basic poly(ether-sulfone) from which they are prepared.

3,748,307
ENDO ALICYCLIC END CAPPED POLYQUINOXALINE RESINS

Eugene A. Burns, Palos Verdes Peninsula, and Robert J. Jones, Hermosa Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Apr. 3, 1972, Ser. No. 240,831
Int. Cl. C08g *9/06*
U.S. Cl. 260—72.5 **18 Claims**

Resins having high temperature stability can be made by curing chemically stable alicyclic endo end capped aromatic prepolymers. The prepolymers can be made by reacting proper stoichiometric amounts of a glyoxal with an aromatic tetraamine, and an end capping compound having the formula:



wherein Y_1–Y_8, inclusive, can be hydrogen, halogen, nitro, aryl, alkyl, alkyl ether, or alkaryl; X can be carbonyl, oxygen, sulfur, methylene, halogen substituted methylene, alkyl substituted methylene, or aryl substituted methylene; Z_1 can be an arylene radical, an alkylene radical having 0 to 4 carbon atoms or an amine substituted methylene radical; Z_2 can be a glyoxal radical, a diamine radical, or an amine radical; and Y_7 can be hydrogen, halogen, nitro, aryl, alkyl, alkyl ether, alkaryl or amino in a stable combination with Y_8. However, no more than two amino groups, in the aggregate may be present at once on Z_2, Z_1 and Z_2, or Z_2 and Y_7 substituent positions. The end capping compound can be synthesized by reacting a cyclodiolefin with an olefinic compound according to a Diels-Alder reaction.

3,748,308
POLYESTERS WITH POLYCARBOXY TERMINAL GROUPS

Thomas A. Ashe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 776,749, Nov. 18, 1968. This application Mar. 3, 1971, Ser. No. 120,771
Int. Cl. C08g *17/14*
U.S. Cl. 260—78.3 R **5 Claims**

The polymers of this invention are made by first preparing a hydroxyl terminated polyester and then reacting this polyester with an anhydride. The polymers are useful as film-formers in coating compositions.

3,748,309
POLYESTER RESINS FROM POLYAMINES AND PHTHALIC ACIDS

Jerry H. Hunsucker, Terre Haute, and Daniel G. Mudd, Brazil, both of Ind., assignors to Commercial Solvents Corporation, Terre Haute, Ind.

Filed May 12, 1971, Ser. No. 142,779
Int. Cl. C08g 17/08
U.S. Cl. 260—75 N 6 Claims

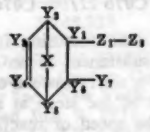
Resinous polyester compositions having particular utility in emulsion wax preparations to promote leveling. The resin is the product of the dehydration reaction of an aminoalkanediol or triol with phthalic acid.

3,748,310
ENDO ALICYCLIC END CAPPED POLYIMIDAZOPYRROLONE

Eugene A. Burns, Palos Verdes Peninsula, and Robert J. Jones, Hermosa Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Apr. 3, 1972, Ser. No. 240,832
Int. Cl. C08g 20/00, 20/32
U.S. Cl. 260—78.4 R 14 Claims

Resins having high temperature stability can be made by curing chemically stable alicyclic endo end capped aromatic prepolymers. The prepolymers can be made by reacting proper stoichiometric amounts of tetraacids or derivatives with an aromatic tetraamine, and an end capping compound having the formula



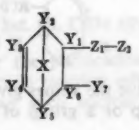
wherein Y_1–Y_8, inclusive, can be hydrogen, halogen, nitro, aryl, alkyl, alkyl ether, or alkaryl; X can be carbonyl, oxygen, sulfur, methylene, halogen substituted methylene, alkyl substituted methylene, or aryl substituted methylene; Z_1 can be an arylene or an alkylene group having 0 to 1 carbon atoms; Z_2 can be an isocyanate radical or an amine radical; and Y_7 can be an isocyanate radical or amino in a stable combination with Y_8. The end capping compound can be synthesized by reacting a cyclo diolefin with an olefinic compound according to a Diels-Alder reaction.

3,748,311
HETEROCYCLIC ENDO ALICYCLIC END CAPPED RESINS

Eugene A. Burns, Palos Verdes Peninsula, and Robert J. Jones, Hermosa Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Apr. 3, 1972, Ser. No. 240,800
Int. Cl. C08g 20/00, 20/32, 20/38
U.S. Cl. 260—78.4 R 15 Claims

Resins having high temperature stability can be made by curing chemically stable alicyclic endo end capped aromatic prepolymers. The prepolymers can be made by reacting proper stoichiometric amounts of an aromatic dicarboxylic derivative with a polyfunctional substituted aromatic amine, such as a tetraamine, dithioldiamine, or a dihydroxydiamine, and an end capping compound having the formula



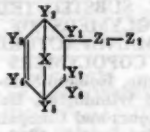
wherein Y_1–Y_8, inclusive, can be hydrogen, halogen, nitro, aryl, alkyl, alkyl ether, or alkaryl; X can be carbonyl, oxygen, sulfur, methylene, halogen substituted methylene, alkyl substituted methylene, or aryl substituted methylene; Z_1 can be an arylene radical or an alkylene group having 0 to 4 carbon atoms; Z_2 can be an acid group, an acid halide, an amine, or an ester group; and Y_7 can be hydrogen, halogen, nitro, aryl, alkyl, alkyl ether, alkaryl, or amino in a stable combination with Y_8. The end capping compound can be synthesized by reacting a cyclodiolefin with an olefinic compound according to a Diels-Alder reaction.

3,748,312
THERMOSETTING HYDRAZIDE POLYMERS

Eugene A. Burns, Palos Verdes Peninsula, and Robert J. Jones, Hermosa Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Apr. 3, 1972, Ser. No. 240,799
Int. Cl. C08g 20/00, 20/32, 20/38
U.S. Cl. 260—78.4 R 15 Claims

Resins having good thermal and chemical stability can be made by curing chemically stable alicyclic endo end capped aromatic prepolymers. The prepolymers can be made by reacting proper stoichiometric amounts of an aromatic or aliphatic polycarboxylic acid or derivative with a substituted or unsubstituted hydrazine compound, such as methylhydrazine, dimethylhydrazine, phenylhydrazine, or diphenylhydrazine, and end capping with an alicyclic endo compound having the formula:



wherein Y_1–Y_7, inclusive, can be hydrogen, halogen, nitro, aryl, alkyl, alkyl ether, or alkaryl; X can be carbonyl, oxygen, sulfur, methylene, halogen substituted methylene, alkyl substituted methylene, or aryl substituted methylene; Z_1 can be an arylene radical or an alkylene group having 0 to 4 carbon atoms; and Z_2 can be an acid group, an acid halide, an amine, or an ester group. The end capping compounds are synthesized by reacting a cyclodiolefin with an olefinic compound according to a Diels-Alder reaction.

3,748,313
ONE-PART POLYTHIOL COMPOSITIONS CONTAINING ENCAPSULATED ACTIVATORS

George F. Bulbenko, Levittown, Pa., and Earl H. Sorg, Trenton, and John P. Gallagher, Hamilton Square, N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Continuation-in-part of application Ser. No. 128,150, Mar. 25, 1971, which is a continuation of application Ser. No. 844,211, July 23, 1969, now abandoned. This application July 24, 1972, Ser. No. 274,761
Int. Cl. C08g 23/00
U.S. Cl. 260—79 12 Claims

Storage-stable, curable, substantially anhydrous liquid polythiol polymer sealant or adhesive compositions having incorporated therein a substantially anhydrous dormant curing agent for the polymer, and mechanically fracturable capsules containing an activator for the curing agent, e.g., water. The cure of the composition is initiated at the time of application by subjecting the composition to mechanical forces, as for example, by passing through a gear pump.

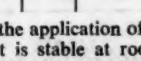
3,748,314

ONE PACKAGE HEAT ACTIVATABLE POLYSULFIDE CURE SYSTEM

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Oct. 16, 1972, Ser. No. 298,161
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 **11 Claims**

Liquid polymers containing —SH groups are cured with inorganic oxidizing agents in the presence of compounds containing at least one



group which, upon the application of heat, accelerates the curing reaction, but is stable at room temperature.

3,748,315

HEAT RESISTANT URETHANE COATINGS

George Sidney Wooster, Hamburg, and Voldemar Kirss, Buffalo, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed July 6, 1971, Ser. No. 159,855
Int. Cl. C08g *22/24, 22/32*
U.S. Cl. 260—75 NT **8 Claims**

Urethane coatings can be prepared from blocked prepolymers of tris(2 - hydroxyethyl)isocyanurate and 4,4'-methylenebis(cyclohexylisocyanate) reacted with hydroxyl terminated polyol esters or polyol amines. The stable urethane coating solutions are applied to metal substrates and cured at elevated temperatures to form continuous temperature resistant coatings.

3,748,316

FUNCTIONALLY SUBSTITUTED TERPOLYMERS AND TETRAPOLYMERS OF α-OLEFINS AND PROCESS FOR MANUFACTURING FUNCTIONAL SUBSTITUTED COPOLYMERS

John Wilfred Collette, Rolland Shih-Yuan Ro, and Fred Max Sonnenberg, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 2, 1969, Ser. No. 829,758
Int. Cl. C08f *15/40, 27/10*
U.S. Cl. 260—80.75 **2 Claims**

Addition terpolymers of ethylene with an α-olefin and an unsaturated, functionally substituted monomer. Addition tetrapolymers of ethylene with an α-olefin having 3–18 carbon atoms, a nonconjugated diene having only one polymerizable double bond, and an unsaturated, functionally substituted monomer. A process for preparing copolymers of ethylene with an unsaturated functionally substituted monomer, and optionally also with at least one of the following: an α-olefin having 3–18 carbon atoms and a nonconjugated diene having only one polymerizable double bond; wherein the monomers are contacted in the presence of a vanadium compound soluble in hydrocarbons and chlorinated hydrocarbons, in which vanadium is in the oxidation state of at least +3, an organoaluminum compound, and an organic compound having at least one carbon atom substituted by three halogen atoms which can be chlorine or bromine.

3,748,317

NONBURNING, LOW SMOKE, LOW TOXIC GAS-PRODUCING THERMOSETTING PREPREG COMPOSITIONS

Stanley Oswitch, University Heights, and Robert F. Golownia, Warrensville Heights, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

No Drawing. Continuation of application Ser. No. 52,076, July 2, 1970. This appplication Jan. 5, 1972, Ser. No. 215,692
Int. Cl. C08g *51/10*
U.S. Cl. 260—37 R **15 Claims**

The prepreg compositions disclosed herein comprise a fiber-reinforced composition in which the binder is a furane resin containing a latent catalyst such as a boron trifluoride-amine for curing the prepreg. These prepregs are found suitable for application to the interior of aircraft cabins in view of their tendency to give off very little smoke and very little toxic gases upon exposure to flames.

3,748,318

ALKYLATION OF POLYSTYRENE

Jerome Robert Olechowski, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Sept. 3, 1971, Ser. No. 177,882
Int. Cl. C08f *7/04, 27/00*
U.S. Cl. 260—93.5 A **10 Claims**

A styrene polymer, such as a molding grade polystyrene, is alkylated with an alkene while in contact with a catalyst composition comprising a transition metal salt, an organometallic compound of a Group I–A, II–A, II–B, or III–A metal, and a proton donor. In accordance with preferred embodiments of the invention, the alkene is a normally gaseous alkene, and the catalyst composition consists essentially of a halide of tungsten, molybdenum, or rhenium, an alkyl aluminum halide, and a lower alkanol.

3,748,319

PROCESS FOR MANUFACTURING UREA-FATTY SUBSTANCE INCLUSION COMPOUNDS

Glenn E. Tolle and Edwin G. Marhofer, Pittsburg, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

No Drawing. Filed Dec. 6, 1971, Ser. No. 205,333
Int. Cl. C07b *21/00*; C07c *127/00*
U.S. Cl. 260—96.5 **2 Claims**

The process for manufacturing inclusion compounds of urea and fatty substances in an aqueous medium is improved by use of a slurry instead of a solution of urea and performing all of the steps at ambient temperature so as to improve the speed of reaction and reduce heat requirements.

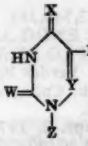
3,748,320

PROCESS FOR THE PREPARATION OF PYRIMIDINE NUCLEOSIDES

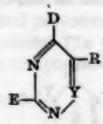
Helmut Vorbrüggen and Ulrich Niedballa, Berlin, Germany, assignors to Schering AG., Berlin, Germany

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,783
Claims priority, application Germany, Apr. 11, 1969, P 19 19 307.8; Aug. 23, 1969, P 19 43 428.7
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **11 Claims**

An improved process for producing pyrimidine nucleosides of the formula



wherein R is H, lower-alkyl, —NO_2 or C≡N, W is O or S, X is O or =N—B in which B is H, alkyl, aryl or aralkyl and Z is a masked sugar residue, having cytotoxic, antiviral, enzyme-inhibiting, immunosuppressive, anti-inflammatory and anti-psoriatic activity, by reacting a 1-O-acyl, 1-O-alkyl or 1-halo sugar whose free hydroxy groups are blocked by ether and/or ester groups with a pyrimidine derivative of the formula



wherein R and Y have the values given above, D is a silyl or alkyl ether group or a group of the formula (alkyl)

Si-NB or alkyl-NB wherein B has the value given above, using $SnCl_4$, $TiCl_4$, $ZnCl_2$, BF_3 (etherate), $AlCl_3$ or $FeCl_3$ as the reaction catalyst.

3,748,321
N-AMINOALKYL-BENZALKYLENIMINE CARBOXAMIDES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Continuation of abandoned application Ser. No. 723,892, Apr. 24, 1968, which is a division of application Ser. No. 435,677, Feb. 26, 1965, now Patent No. 3,395,150. This application Sept. 1, 1971, Ser. No. 177,144

Int. Cl. C07d *41/08*

U.S. Cl. 260—239 BB **2 Claims**

N-diloweralkylamino lower alkyl-N-lower alkyl-1-benzalkylenimine-1-carboxamides useful as tranquilizers.

3,748,322
4-AZA-5-CARBAMOYLOXIMIDO-TRICYCLO-[4.3.1.1^{3,8}]UNDECANES

Kyu Tai Lee, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 11, 1971, Ser. No. 152,407

Int. Cl. C07d *41/04*

U.S. Cl. 260—239 BF **4 Claims**

This invention relates to a class of 4-aza-5-carbamoyloximidotricyclo[4.3.1.1^{3,8}]undecanes that exhibit antihypertensive activity in warm-blooded animals. A typical compound is 4-aza-5-(N-methyl)carbamoyloximidotricyclo [4.3.1.1^{3,8}]undecane.

3,748,323
6-(SULFATO ACYLAMINO)PENICILLANIC ACIDS AND ESTERS THEREOF

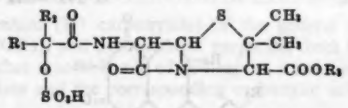
Ernest S. Hamanaka, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed July 9, 1971, Ser. No. 161,300

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **10 Claims**

Broad-spectrum antibacterial agents; namely, 6-(sulfato acylamino)penicillanic acids of the formula:



and the non-toxic cationic salts thereof wherein

R_1 is thienyl, alkyl, cycloalkyl, phenyl or substituted phenyl wherein the substituent is lower alkyl, lower alkoxy, chloro, bromo or trifluoromethyl;

R_2 is hydrogen or lower alkyl;

R_1 and R_2 together with the carbon atom to which they are attached represent cycloalkyl;

R_3 is hydrogen and acyloxy lower alkyl wherein the acyloxy moiety is lower alkanoyloxy, benzoyloxy or substituted benzoyloxy wherein the substituent is chloro, bromo, fluoro, lower alkyl, lower alkoxy or trifluoromethyl.

3,748,324
METHOD FOR THE PURIFICATION OF SUCROSE ESTERS OF FATTY ACIDS

Norio Mizutani, Ichiro Sasaki, Takamitsu Ito, and Hiroshi Ueno, Kyoto, Shoichi Nishizaki, Hikone, and Tetsuo Ishizuka, Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Shimogyo-ku, Kyoto, Japan

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,040

Claims priority, application Japan, Feb. 5, 1969, 44/8,598; Sept. 22, 1969, 44/75,652; Oct. 29, 1969, 44/87,078

Int. Cl. C07c *69/32*

U.S. Cl. 260—234 R **9 Claims**

The process for the purification of sucrose esters of fatty acids from crude reaction mixtures or the like compositions containing such sucrose esters comprises the steps of dissolving the crude reaction mixture or the like in a solution of the mixture of an organic solvent with water to form a system and removing impurities contained in said crude reaction mixture or the like dissolved in said solution by carrying out any one of the following treatments or their combinations:

(a) adding to the system an acid or an acid salt in an amount necessary to acidify said system so as to have a pH value within the range of 3.5 to 5.0, whereby the sucrose ester is recovered by a liquid-liquid extraction operation;

(b) adding to said system a salt of a metal whose valence is at least two to form double decomposition salts, and then removing said double decomposition salts to recover the sucrose ester; and

(c) adding to said system a water soluble substance to recover the sucrose ester by precipitation.

3,748,325
PROCESS FOR THE PREPARATION OF QUINAZOLINONE DERIVATIVES

Shankar Somasekhara and Vijaya Shanker Dighe, both % Karamchand Premchand Private Ltd., Sarabhai Research Centre, Wadi Wadi, Post Box 162, Baroda–7, Gujarat, India

Filed Oct. 5, 1970, Ser. No. 78,142

Claims priority, application India, Apr. 6, 1970, 126,066

Int. Cl. C07d *51/48*

U.S. Cl. 260—240 E **4 Claims**

This invention relates to the preparation of quinazolinone derivatives of the general formula as shown in FIG. V of the accompanying drawings wherein R is 2-, 3- or 4-pyridyl and their acid addition salts.

These quinazolinone compounds are of pharmacological interest and have been found to possess sedative, hypnotic and anticonvulsant properties.

3,748,326
5-HYDROXY-1-[(5-NITROFURFURYLIDENE)-AMINO]HYDANTOIN

Thomas J. Schwan and Ralph L. White, Jr., Norwich, N.Y., assignors to Morton-Norwich Products, Inc.

No Drawing. Filed Jan. 17, 1972, Ser. No. 218,554

Int. Cl. C07d *49/32*

U.S. Cl. 260—240 A **2 Claims**

5-hydroxy-1-[(5-nitrofurfurylidene)amino]hydantoin is a useful antibacterial agent.

3,748,327
BASICALLY SUBSTITUTED 4(3H)-QUINAZOLINONE DERIVATIVES

Rudi Beyerle, Bruchkobel, Germany, and Adolf Stachel, deceased, late of Frankfurt am Main-Fechenheim, Germany, by Ingeburg Lydia Katarina Stachel, heiress-at-law, Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

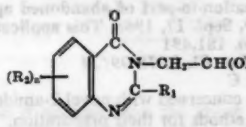
No Drawing. Filed Apr. 22, 1971, Ser. No. 136,556

Claims priority, application Germany, Apr. 25, 1970, P 20 20 234.0

Int. Cl. C07d *51/48*

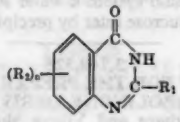
U.S. Cl. 260—243 B **3 Claims**

The present invention relates to pharmaceutically active basically substituted 4(3H)-quinazolinone derivatives possessing anticonvulsant and sedative properties and useful as intermediates in the manufacture of coronary dilators and having the structural formula



wherein R stands for a radical selected from the group consisting of secondary aliphatic, cycloaliphatic or arali-

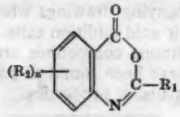
phatic amines having 2–10 carbon atoms and 5-, 6- or 7-membered heterocyclic nitrogen bases which contain in addition to the nitrogen atom a corresponding number of methylene groups, as well as optionally an additional nitrogen atom, an O or an S atom, said radical being bound via a nitrogen atom; R_1 stands for hydrogen, an alkyl radical having from 1 to 4 carbon atoms, a pyridyl radical, a benzyl or a phenyl radical, the two latter being optionally substituted by lower alkyl, lower alkoxy groups or halogen; R_2 represents hydrogen, nitro, amino, trifluoromethyl or lower alkoxy groups having from 1 to 4 carbon atoms, and n means an integer from 1 to 4; and to the production of such derivatives by (a) reacting a 4(3H)-quinazolinone having the formula



with a γ-halogeno-β-hydroxypropylamine having the formula

$$Hal—CH_2—CH(OH)CH_2—R$$

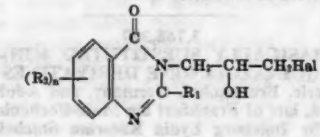
or by (b) condensing a 4H-3,1-benzoxazine-4-one having the formula



with a γ-amino-β-hydroxypropylamine having the formula

$$H_2N—CH_2—CH(OH)CH_2—R$$

or by (c) condensing a 4(3H)-quinazolinone which is substituted in the 3-position by a γ-halogeno-β-hydroxypropyl radical and has the formula



or the corresponding epoxy compound with a secondary amine having the general formula RH.

3,748,328

2-AMIDOCEPHALOSPORINS

Milton Wolf, West Chester, and John H. Sellstedt, King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 107,437, Jan. 18, 1971, which is a continuation-in-part of application Ser. No. 843,841, July 22, 1969, now Patent No. 3,635,953, dated Jan. 18, 1972, which in turn is a continuation-in-part of abandoned application Ser. No. 760,090, Sept. 17, 1968. This application Sept. 17, 1971, Ser. No. 181,491

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **2 Claims**

This invention is concerned with novel 2-amidocephalosporins and with methods for their preparation. The compounds are antibiotically active and/or are useful as intermediates for the preparation of known compounds.

3,748,329

COMPOUNDS CONTAINING THE 2,4,6-TRIKETO-1,3,5-OXADIAZINE RING

Dietrich Liebsch, Leverkusen, Ernst Meisert, Leverkusen-Schlebusch, and Gerhard Stopp, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of application Ser. No. 612,358, Jan. 30, 1967. This application July 8, 1970, Ser. No. 53,277

Int. Cl. C07d *87/52*

U.S. Cl. 260—244 R **1 Claim**

Compounds containing the 2,4,6 - triketo-1,3,5-oxadiazine ring which may be prepared by reacting an organic diisocyanate with carbon dioxide in the presence of certain catalysts including phosphine or arsine catalysts are disclosed as well as porous and non-porous polymers based on the compounds containing the 2,4,6-triketo-1,3,5-oxadiazine ring. The compounds are prepared by saturating an organic polyisocyanate where the isocyanate groups have approximately equal reactivity with carbon dioxide and then catalyzing the reaction of the isocyanate with the carbon dioxide to yield the 2,4,6-triketo-1,3,5-oxadiazine derivative.

3,748,330

BENZOXANTHENE AND BENZOTHIOXANTHENE-DICARBOXYLIC ACID TRIAZINYL-IMIDE DYESTUFFS

Otto Fuchs and Helmut Troster, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

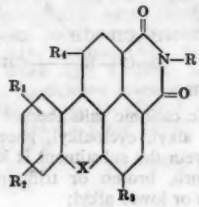
No Drawing. Filed Apr. 13, 1971, Ser. No. 133,755

Claims priority, application Germany, Apr. 14, 1970, P 20 17 763.3

Int. Cl. C07d *55/18, 55/22*

U.S. Cl. 260—249.6 **7 Claims**

Benzoxanthene- and benzothioxanthene-dicarboxylic acid imide dyestuffs of the general formula



wherein

X is oxygen or sulfur,

R is amino which is substituted by one or two members of the group of alkyl, cyclohexyl, benzyl, acyl, phenyl, β-cyanoethyl, β-hydroxyethyl, sulfamidophenyl, benzoyl, dichlorobenzoyl, sulfamidobenzoyl, carboxamidophenyl, phenylsulfonyl sulfamidodichlorobenzoyl, chlorophenyl, phenoxyacetyl lower alkylsulfamidobenzoyl and benzimidazoyl, or 2,4,6-triaminotriazinyl, 2,4-diamino-6-phenyltriazinyl, 2,4-diamino-6-lower alkyl triazinyl-2,4-diamino-6-hydroxy lower alkyl triazinyl, 2,4-diamino-6-chloro lower alkyl triazinyl, 2,4-diamino-6-phenylamino triazinyl, 2,4-diamino-6-lower alkoxy lower alkoxy triazinyl, 2,4-diamino-6-benzoyl-triazinyl,

R_1 and R_2 are hydrogen, chlorine, bromine, cyano, lower carbalkoxy, lower alkyl, lower alkoxy and phenyl,

R_3 and R_4 are hydrogen, lower alkoxy and lower hydroxy alkoxy.

3,748,331

1,4-DISUBSTITUTED-METHYLENEDIOXY - 2-(1H)-QUINAZOLINONES AND QUINAZOLINTHIONES

George A. Cooke, Denville, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., East Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 34,902, May 5, 1970, which is a continuation-in-part of application Ser. No. 881,325, Dec. 1, 1969, both now abandoned. This application May 6, 1971, Ser. No. 141,010

Int. Cl. C07d *51/48*

U.S. Cl. 260—251 QB 30 Claims

Disclosed are compounds of the class of 1-alkyl-4-phenyl and 4-(2-thienyl) - 6,7 - methylenedioxy-2(1H)-quinazolinones and quinazolinthiones, including the 3,4-dihydro derivatives thereof, useful as pharmaceutical agents, e.g. as anti-inflammatory agents. Such compounds, e.g. 1-isopropyl - 4 - phenyl-6,7-methylenedioxy-2(1H)-quinazolinones and 1-isopropyl-4-phenyl-6,7-methylenedioxy-2(1H)-quinazolinthiones, may be prepared by reacting the corresponding N-alkyl-N-(3-,4-methylenedioxyphenyl)urea or thiourea with an aromatic aldehyde, e.g. benzaldehyde, in the presence of an acid at elevated temperatures to obtain the 3,4-dihydro-2(1H)-quinazolinones or 3,4-dihydro-2(1H)-quinazolinthiones which may then be oxidized to the corresponding 3,4-unsaturated compounds.

3,748,332

CATALYSIS

Geoffrey Wilkinson, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

No Drawing. Filed July 7, 1970, Ser. No. 53,032

Claims priority, application Great Britain, July 14, 1969, 35,249/69

Int. Cl. C07f *15/00*

U.S. Cl. 260—270 R 3 Claims

Ruthenium (II) carboxylates of the general formula $Ru_2(OCOR)_4$, and processes for preparing them by heating together a soluble salt of ruthenium, a soluble salt of carboxylate and the corresponding carboxylic acid.

3,748,333

PALLADIUM HYDROGENATION PROCESS FOR 3,4 DIHYDROISOQUINALINES

Claude Jeanmart, Bruno; Mayer Naoum Messer, Bievres, and Pierre Simon, Montrouge, all of France, assignors to Rhone-Poulenc S.A., Paris, France

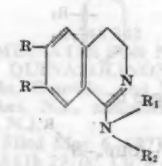
Filed Jan. 19, 1971, Ser. No. 107,859

Claims priority, application France, Jan. 21, 1970, 7002128

Int. Cl. C07d *35/14*

U.S. Cl. 260—286 R 4 Claims

3,4-Dihydroisoquinolines having antitussive and antifibrillating properties of formula:



wherein the symbols R represent hydrogen or methoxy or together form a methylenedioxy group, R_1 represents hydrogen or alkyl, and R_2 represents alkyl or dialkylaminoalkyl, are prepared by hydrogenation of a corresponding isoquinoline derivative employing a palladium catalyst.

3,748,334

2,6-BIS(TRIFLUOROMETHYL)-4-PYRIDINOLS

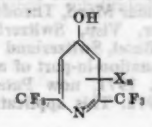
Raymond H. Rigterink, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 99,665, Dec. 18, 1970. This application Apr. 12, 1972, Ser. No. 243,411

Int. Cl. C07d *31/28*

U.S. Cl. 260—297 R 4 Claims

This invention provides 2,6-bis(trifluoromethyl)-4-pyridinols having the formula:



wherein

each X independently represents bromo, chloro or iodo, *n* represents an integer of from 0 to 2, both inclusive, and the salts thereof. The novel compounds are suitable for use as herbicides and fungicides.

3,748,335

PHOSPHORAMIDATE ESTERS

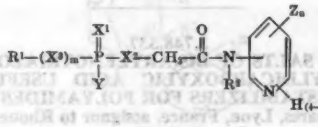
Sidney B. Richter, Chicago, and Leonard J. Stach, Riverside, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Original application Nov. 25, 1968, Ser. No. 778,768, now Patent No. 3,632,814, dated Jan. 4, 1972. Divided and this application Feb. 12, 1971, Ser. No. 115,080

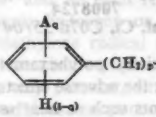
Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 K 3 Claims

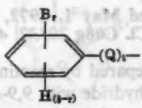
This invention discloses new compounds of the formula



wherein R^1 is selected from the group consisting of alkyl, alkenyl and



wherein A is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, nitro, dialkylamino, alkylsulfoxide and alkylsulfone, *q* is an integer from 0 to 5, and *p* is an integer from 0 to 3; X^1, X^2 and X^3 are independently selected from the group consisting of oxygen and sulfur; *m* is an integer from 0 to 1; Y is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, amino, alkylamino, dialkylamino and



wherein B is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, nitro, dialkylamino, alkylsulfoxide and alkylsulfone, *r* is an integer from 0 to 5, Q is selected from the group consisting of oxygen, sul-

fur, alkylene, alkyleneoxy and alkylenethio, and *t* is an integer from 0 to 1; R^2 is alkyl; Z is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen and nitro, and *n* is an integer from 0 to 4. The above described compounds are useful as pesticides, particularly as insecticides and acaricides.

3,748,336

PROCESS FOR THE PRODUCTION OF PYRIDINE CARBOXYLIC ACIDS

August Stocker, Othmar Marti, Theodul Pfammatter, and Gerhart Schreiner, Visp, Switzerland, assignors to Lonza Ltd. A.G., Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 871,951, Oct. 28, 1971, now Patent No. 3,657,259, dated Apr. 18, 1972. This application July 19, 1971, Ser. No. 164,002

The portion of the term of the patent subsequent to Apr. 18, 1989, has been disclaimed

Int. Cl. C07d *31/36*

U.S. Cl. 260—295 R 22 Claims

Nicotinic acid and other carboxylic acids having a pyridine nucleus may be prepared by the oxidation of fused-ring pyridine compounds in the presence of 25 to 600 percent excess nitric acid at temperatures of 180° to 370° C. with pressures of 20 to 500 atm. The nitric acid concentration of the reaction mixture is adjusted to 10 to 28 percent to precipitate as crystalline hydronitrate and separated from the mixture. The pH of an aqueous solution of the pyridine carboxylic acid hydronitrate is adjusted with the basic starting material to the isoelectric point of the specific pyridine carboxylic acid to precipitate the same. The crystalline precipitation is separated and the mother liquors are combined and recycled as the starting material after adjustment of the concentrations therein.

3,748,337

COPPER SALTS OF BIS(ARYLENOTRIAZOLE)DIPHENYLDICARBOXYLIC ACID USEFUL AS HEAT STABILIZERS FOR POLYAMIDES

Hubert Linares, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,534

Claims priority, application France, Mar. 11, 1970, 7008724

Int. Cl. C07d *55/04*

U.S. Cl. 260—299 8 Claims

Polyamides, especially polyhexamethylene adipamide, are stabilized against the adverse effects, especially yellowing, of heat treatments such as heat setting by incorporation of a copper salt of a bis(arylenotriazole)diphenyldicarboxylic acid.

3,748,338

SOLUBLE POLYIMIDES FROM AROMATIC DIANHYDRIDES AND 10,10-DI-(p-AMINOPHENYL) THIOXANTHENE

Franklin P. Darmory and Marianne Di Benedetto, Ardsley, N.Y., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed May 1, 1972, Ser. No. 249,023

Int. Cl. C08g *20/32, 45/44*

U.S. Cl. 260—30.2 19 Claims

Polyimides are prepared by reacting an aromatic tetracarboxylic acid dianhydride with 9,9-di-(p-aminophenyl)-thioxanthene. These polyimides are soluble in certain organic solvents whereby they can be fabricated into films, coatings, laminates and the like. The polyimides are also fusible and moldings thus obtained are low in void content.

3,748,339

2-[3-[1-(DIMETHYLAMINO)ALKYL] - 1,5-DIHYDRO-5-OXO - 1 - SUBSTITUTED-4H-1,2,4-TRIAZOL-4-YL]BENZOPHENONE AND PROCESS

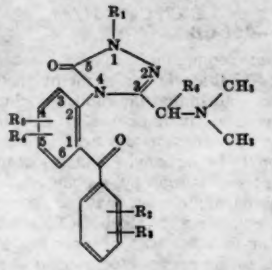
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed May 5, 1972, Ser. No. 250,530

Int. Cl. C07d *55/06, 57/00, 99/02*

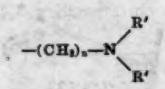
U.S. Cl. 260—308 C 5 Claims

2-[3 - [1 - (dimethylamino)alkyl]-1,5-dihydro-5-oxo-1-substituted - 4H - 1,2,4 - triazol-4-yl]benzophenone of the Formula II

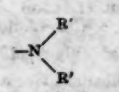


(II)

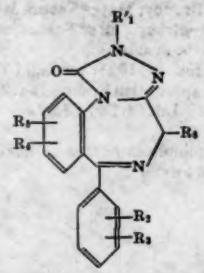
wherein R_1 is selected from the group consisting of hydroxymethyl and



in which *n* is 2 or 3 and R' is alkyl of 1 to 3 carbon atoms, inclusive, or together

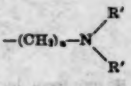


is a heterocyclic ring moiety selected from the group consisting of pyrrolidino, piperidino, morpholino, and 4-alkylpiperazino in which alkyl is defined as above; and wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino, in which the carbon chain moiety is of 1 to 3 carbon atoms, inclusive, and dialkylamino in which alkyl is defined as above; and wherein R_6 is hydrogen or alkyl defined as above, are produced by reacting a 2-substituted-5-phenyl-4H-s-triazolo [4,3-a][1,4]benzodiazepine-1-one of the Formula (I):



(I)

wherein R'_1 is hydrogen or



defined as above, and R_2, R_3, R_4, R_5, and R_6 are defined as above with formic acid and formaldehyde, to give the corresponding compound of Formula II.

The new products of Formula II including their phar-

macologically acceptable acid addition salts are useful as sedatives, tranquilizers, and muscle relaxants in mammals and birds.

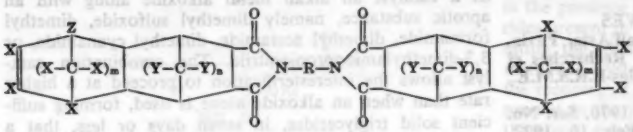
3,748,340

BIS-IMIDES OF POLYHALO SUBSTITUTED POLYHYDROPOLYCYCLICDICARBOXYLIC ACIDS

Charles M. Hayes, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,801
Int. Cl. C07d 27/52
U.S. Cl. 260—326 C 3 Claims

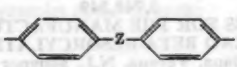
A novel composition of matter of the formula:



in which X and Y are selected from the group consisting of hydrogen and halogen radicals, at least two X's being halogen; R is selected from the group consisting of C_2–C_4 alkylene, phenylene, cyclohexylene,

$$-(CH_2)_2NH(CH_2)_2NH(CH_2)_2-$$

and



wherein Z is oxygen, sulfur or amino; *m* is 1 or 2; and *n* is 1 or 2. The novel compositions of matter are useful as additives for plastics, polymers, etc. whereby flameproof or fire-retardant properties are added thereto.

3,748,341

PROCESS OF PREPARING 1-SUBSTITUTED-2-AMINOMETHYLPYRROLIDINES AND INTERMEDIATES THEREFOR

Takashi Kamiya, Suita, and Masashi Hashimoto, Toyonaka, Japan, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

No Drawing. Continuation-in-part of abandoned application Ser. No. 850,234, Aug. 14, 1969. This application July 14, 1971, Ser. No. 162,623
Claims priority, application Japan, Aug. 19, 1968, 43/59,377; May 20, 1969, 44/38,886; June 9, 1969, 44/45,174
Int. Cl. C07d 27/04
U.S. Cl. 260—326.8 16 Claims

1-alkyl-2-aminomethylpyrrolidines and 1-benzyl-2- aminomethylpyrrolidines are utilized for the production of pharmaceuticals. The presently used process for producing such compounds involves significant contamination by undesired by-products. The process of this invention avoids such contamination by the utilization of novel intermediates.

3,748,342

INTERMEDIATES FOR PREPARING QUINAZOLINONES

George A. Cooke, Denville, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed May 6, 1971, Ser. No. 140,990
Int. Cl. A61k 27/00; C07d 63/12, 63/14
U.S. Cl. 260—332.3 P 1 Claim

Processes are provided for preparing 1,4-disubstituted-methylenedioxy - 2(1H) - quinazolinones which are useful as pharmaceutical agents, e.g., anti-inflammatory agents.

3,748,343

QUATERNARY THENYL AMMONIUM SALTS

Peter F. Epstein, Prairie Village, Kans., Joseph R. Caffrey, Independence, Mo., and Pyung Kyung Yu, Overland Park, Kans., assignors to Chemagro Corporation, Kansas City, Mo.

No Drawing. Filed Feb. 17, 1971, Ser. No. 116,258
Int. Cl. C07d 63/14
U.S. Cl. 260—332.5 8 Claims

Quaternary thenyl ammonium salts, i.e. [(optionally 2, 3, 4 and/or 5 halo, alkyl, cyano, alkoxycarbonyl and/or nitro-substituted)-5 or 4-thenyl]-[tri(same or mixed) alkyl, alkenyl, alkinyl, substituted alkyl, cycloalkyl, heterocyclic and/or aryl]-ammonium salts, i.e. halides, nitrates, azides, thiocyanates, sulfates, phosphates, O-ethylxanthates, etc., which possess plant-growth regulating properties, including synergistic properties.

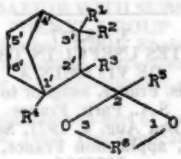
3,748,344

CYCLIC KETALS AND ACETALS OF NORBORNANE CARBOXYALDEHYDE

Darvin L. McCloud, Overland, and Alfred A. Schleppnik, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

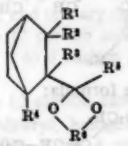
No Drawing. Filed Dec. 27, 1971, Ser. No. 212,740
Int. Cl. C07d 13/04, 15/04
U.S. Cl. 260—340.7 5 Claims

Chemical compounds characterized by the structural formula



wherein R^1, R^2, R^3 and R^4 each represent hydrogen or methyl, R^5 represents hydrogen or lower alkyl and R^6 represents a polymethylene radical of from 2 to 4 carbon atoms which is unsubstituted or substituted with lower alkyl groups have very pleasant, strong and long lasting aromas and are useful as components in fragrance compositions. These compounds can be prepared by an acetalization reaction of an appropriate norbornane or norbornene carboxaldehyde or an appropriate norbornyl or norbornenyl alkyl ketone with a dihydric alcohol.

The novel chemical compounds characterized by the structural formula



wherein R^1, R^2, R^3, R^4, R^5 and R^6 are as defined above are particularly preferred due to their outstanding usefulness as aroma chemicals.

3,748,345

PREPARATION OF ALKYLENE CARBONATES BY REACTION OF ALKYLENE OXIDES WITH CARBON DIOXIDE

Ralph J. De Pasquale, Berkeley, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed July 2, 1971, Ser. No. 159,558
Int. Cl. C07d *13/06*
U.S. Cl. 260—340.2 9 Claims

Alkylene carbonates are prepared by reacting an alkylene oxide with carbon dioxide in the presence of a coordinatively unsaturated zero-valent nickel complex.

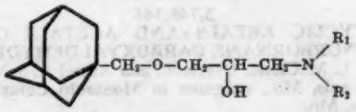
3,748,346

ADAMANTANE DERIVATIVES

Andrea Pedrazzoli, Milan, and Leone Dall'Asta, Pavia, Italy, assignors to Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicales-E.R.S.M.E., Paris, France

No Drawing. Original application June 4, 1970, Ser. No. 43,582. Divided and this application Feb. 10, 1972, Ser. No. 225,352
Int. Cl. C07d *1/18*
U.S. Cl. 260—348 R 1 Claim

Adamantane derivatives having the following general formula:



and their pharmaceutically acceptable acid addition salts are useful as sympaticolytic, myolitic, analgesic and, particularly, as local anaesthetic and β-adrenergic blocking agents. The novel compounds are prepared starting from 1 - hydroxy-methyl-adamantane through the new intermediate 1-(adamantyl-methyloxy)-2,3-epoxypropane.

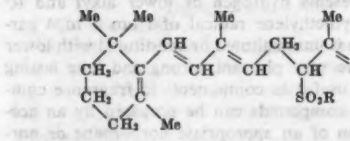
3,748,347

INTERMEDIATES USEFUL IN THE SYNTHESIS OF VITAMIN A

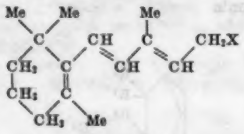
Marc Julia, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Aug. 4, 1971, Ser. No. 169,114
Claims priority, application France, Aug. 5, 1970, 7028906
Int. Cl. C07c *143/90;* C11d *1/28*
U.S. Cl. 260—402 6 Claims

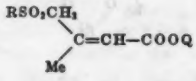
Sulphones of the formula:



in which R is aryl and Q is hydrogen or a hydrocarbon radical, which are made by reacting, preferably at low temperature, a halide of the formula:



and a sulphone of the formula:



are useful intermediates for producing vitamin A into which they may be converted by saponification, desulphonation, and reduction.

3,748,348

DIRECTED-INTERESTERIFIED GLYCERIDIC OILS HAVING A HIGH LINOLEIC ACID CONTENT AND PROCESS FOR THEIR PRODUCTION

Baratham Sreenivasan, Hackensack, N.J., assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed July 27, 1970, Ser. No. 60,780
Int. Cl. A23d *3/02, 5/00;* C11c *3/10*
U.S. Cl. 260—410.7 16 Claims

Glyceridic oils having a high linoleic acid content, and having insufficient solid triglycerides to form a plastic margarine, are subjected to a directed interesterification process at temperatures of 0° to −15° C. using as a catalyst an alkali metal alkoxide along with an aprotic substance, namely dimethyl sulfoxide, dimethyl formamide, dimethyl acetamide, dimethyl cyanamide, or 3,3-dimethylaminopropionitrile. The combination catalyst allows the interesterification to proceed at a higher rate than when an alkoxide alone is used, forming sufficient solid triglycerides, in seven days or less, that a plastic margarine having a linoleic acid-to-saturated acid ratio of 8-to-1 can be made therefrom without the presence of any hydrogenated stock, or having a linoleic acid-to-saturated acid ratio of 6-to-1 with a small proportion of hardstock.

3,748,349

PROCESS FOR THE MANUFACTURE OF LEAD BETA-RESORCYLATES

Daniel R. Satriana, Verona, N.J., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed July 28, 1971, Ser. No. 166,973
Int. Cl. C07f *7/24*
U.S. Cl. 260—435 13 Claims

Dibasic and monobasic lead beta resorcylates are produced by the reaction of lead monoxide and beta-resorcylic acid in an organic solvent medium in selected molar ratios.

3,748,350

COUPLING WITH A PALLADIUM SALT

Roy R. Josephson, West Marlborough Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,904
Int. Cl. C07c *15/12, 15/14*
U.S. Cl. 260—475 R 7 Claims

A process is provided for the coupling of aromatic compounds to produce polynuclear aromatic compounds wherein the reaction is carried out in liquid hydrogen fluoride with a palladium salt as the sole coupling agent. The process is of particular importance in the coupling of electronegatively substituted aromatic compounds whereby the major coupling takes place in the position ortho to the electronegative group.

3,748,351

2,3-BIS(DIFLUORAMINO)-1,4-BUTANEDIOL DIFORMATE AND DINITRATE

Robert K. Armstrong, Glassboro, and Gerald L. Brennan and Robert H. Sullivan, Woodbury, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 12, 1964, Ser. No. 412,277
Int. Cl. C07c *77/02, 69/08*
U.S. Cl. 260—467 7 Claims

1. A process for preparing 2,3-bis(difluoramino)-1,4-butanediol dinitrate which comprises transesterifying a lower aliphatic diester of 2,3 - bis(difluoramino) - 1,4-butanediol with nitric acid.

7. 2,3-bis(difluoramino)-1,4-butanediol diformate.

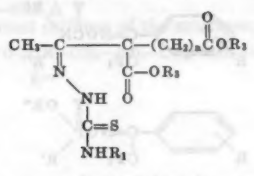
3,748,352

DIALKYL 2-[1-(3-THIOSEMICARBAZONO)ETHYL]-ALKYLENEDIOATES

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Homes Products Corporation, New York, N.Y.

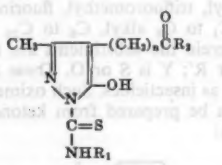
No Drawing. Original application Dec. 30, 1970, Ser. No. 102,952, now Patent No. 3,704,242. Divided and this application July 25, 1972, Ser. No. 274,957
Int. Cl. C07c *159/00*
U.S. Cl. 260—481 R 4 Claims

Dialkyl 2 - [1 - (3-thiosemicarbazono)ethyl]succinates and glutarates of the formula:



wherein

R_1 is hydrogen or lower alkyl, R_3 is lower alkyl and n is 1 or 2, are intermediates for the preparation of 5-hydroxy-3-alkyl-1-(thiocarbamoyl or alkylthiocarbamoyl)pyrazoles of the formula:



in which

R_1 is hydrogen or lower alkyl,

R_2 is hydroxy, amino or lower alkoxy, and

n is 1 or 2,

the latter compounds being active as inhibitors of *Mycobacterium tuberculosis*.

3,748,353

METHOD OF IMPROVING DETERGENCY OF ALKYLPHENOL POLYSULFONATES BY BASE PRECIPITATION AND SEPARATION

Eric D. Hannah, Mill Valley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Mar. 16, 1971, Ser. No. 124,424
Int. Cl. C11d *1/22*
U.S. Cl. 260—512 R 6 Claims

Process for enhancing the detergency of linear alkylphenol polysulfonate detergent actives containing from 25 to 50 mol percent of para-alkyl materials which comprises mixing sufficient base with the material in aqueous solution to form a precipitate and removing the precipitate.

3,748,354

SPIRO[3,3]HEPTANE AMINO ACIDS

Larry J. Loeffler, Bethesda, Md., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Apr. 1, 1970, Ser. No. 24,885, now Patent No. 3,666,790. Divided and this application June 16, 1971, Ser. No. 153,859
Int. Cl. C07c *101/04, 101/14, 101/18*
U.S. Cl. 260—514 G 3 Claims

Novel spiro[3.3]heptane amino acids and their derivatives are disclosed and their method of preparation is described.

3,748,355

CRYSTALLIZATION PROCESS FOR THE RECOVERY OF ALKALINE NITRILOTRIACETATES

Yolande Bourgau, Bron, Jean-Claude Leroi, Villeurbanne, and Francois Mounier, Champagne au Mont d'Or, France, assignors to Rhone-Progil, Paris, France

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,102
Claims priority, application France, May 11, 1971, 7117853
Int. Cl. C07c *10/20*
U.S. Cl. 260—534 E 7 Claims

Alkaline nitrilotriacetates prepared by reacting monochloroacetic acid with ammonia and an alkaline hydroxide in the presence of water are separated from alkaline chlorides present in the product solution by selectively precipitating the alkaline nitrilotriacetate with methanol. The methanol crystallization process of the invention permits the recovery of about 95% of the alkaline nitrilotriacetate present in the product solution and the crystals obtained therefrom contain only about 1% of alkaline chloride.

3,748,356

SUBSTITUTED BENZOYL UREAS

Kobus Wellinga and Rudolf Mulder, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed May 14, 1971, Ser. No. 143,668
Claims priority, application Netherlands, May 15, 1970, 7007040
Int. Cl. C07c *127/16*
U.S. Cl. 260—553 E 13 Claims

New 2,6-dihalobenzoyl ureas are disclosed, as well as their method of preparation, said ureas being useful as insecticides.

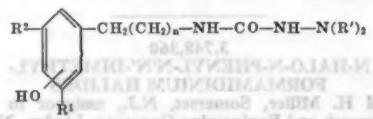
3,748,357

SEMICARBAZIDE WITH SUBSTITUTED PHENYL GROUP

Harald Oertel, Odenthal, Ulrich Eholzer, Cologne, and Friedrich-Karl Rosendahl, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of application Ser. No. 676,082, Oct. 18, 1967. This application June 8, 1970, Ser. No. 44,541
Claims priority, application Germany, Nov. 16, 1966, F 50,689
Int. Cl. C07c *133/02*
U.S. Cl. 260—554 8 Claims

A semicarbazide of the formula:



(I)

wherein

R^1 is selected from the group of tertiary butyl, tertiary amyl, tertiary octyl and tertiary dodecyl;

R^2 is alkyl with 1 to 12 carbon atoms, preferably unsubstituted alkyl with 1 to 4 carbon atoms such as methyl or tertiary butyl;

R' is alkyl with 1 to 12 carbon atoms which can be substituted with a hydroxyl, halogen or mercapto group, preferably alkyl with 1 to 4 carbon atoms such as methyl, hydroxy ethyl or hydroxy propyl;

n is an integer from 0 to 12, preferably 0 or 2; and

with the proviso that the —OH group is ortho to R^1.

Such compounds are useful to stabilize isocyanates against discoloration during storage.

3,748,358

METHOD OF PURIFICATION OF N-ACETYL-p-AMINOPHENOL

Frank A. Baron, Short Hills, N.J., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed June 16, 1970, Ser. No. 46,840
Int. Cl. C07c *103/38*
U.S. Cl. 260—562 P 4 Claims

N-acetyl-p-aminophenol is purified by treating an aqueous solution thereof with charcoal which has been preliminarily washed with an acidic solution, and crystallizing pure N-acetyl-p-aminophenol. The iron content of the N-acetyl-p-aminophenol is reduced by including a chelating agent in the crystallization solvent.

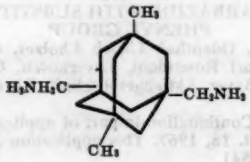
3,748,359

ALKYLADAMANTANE DIAMINE

Robert M. Thompson, Chalfonte, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Oct. 22, 1971, Ser. No. 191,826
Int. Cl. C07c *87/40*
U.S. Cl. 260—563 P 2 Claims

This invention relates to a alkyladamantane diamine; namely, 1,3 - dimethyleneamine-5,7-dimethyladamantane, and to the preparation of it and its homologues from an alkyladamantane diacid The preparation starts with the chlorination of the alkyladamantane diacid which is followed by the amidation of the resulting diacid chloride, which in turn is followed by the dehydration of the resulting diamide and ends with the hydrogenation of the resulting dinitrile. The named diamine has the following structural formula:



and is a white, crystalline solid useful in various applications, for example corrosion inhibitor, chemical intermediate, and a component of useful polymers.

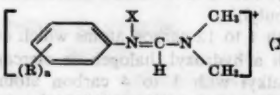
3,748,360

N-HALO-N-PHENYL-N'N'-DIMETHYL-FORMAMIDINIUM HALIDES

Alfred H. Miller, Somerset, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

No Drawing. Original application May 6, 1970, Ser. No. 35,226. Divided and this application July 26, 1972, Ser. No. 275,114
Int. Cl. C07c *123/00*
U.S. Cl. 260—564 R 3 Claims

N-halo-N-phenyl-N'N'-dimethylformamidinium halides characterized by the following structural formula:



wherein R is selected from the group consisting of hydrogen, C_1–C_8 alkoxy, C_1–C_8 alkylthio, C_1–C_8 alkyl, bromine and chlorine; *n* is an integer ranging from 1 to 4; X is one selected from the group consisting of bromine and chlorine. These compounds possess pesticidal activity and show especially good fungicidal activity.

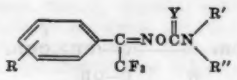
3,748,361

HALO-SUBSTITUTED OXIME CARBAMATES

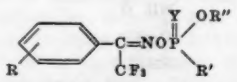
Daniel D. Rosenfeld, East Brunswick, Samuel B. Lippincott, Springfield, and John R. Kilsheimer, Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 718,208, Apr. 2, 1968. This application Apr. 28, 1971, Ser. No. 138,321
Int. Cl. C07c
U.S. Cl. 260—566 AC 14 Claims

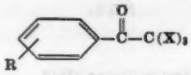
Mono or poly halo-substituted oxime carbamates and phosphates characterized by either one of the following formulas:



or



wherein R is one selected from the group consisting of hydrogen, methyl, isopropyl, ethyl, trifluoromethyl, fluorine, chlorine, bromine, methoxy, methylthio, nitro, dimethylamino, ethoxy, and isopropyloxy; R' is one selected from the group consisting of OR'', C_1 to C_8 alkyl, C_6 to C_{10} aryl, substituted alkyl or aryl wherein said substituent groups are selected from the group consisting of methyl, ethyl, trifluoromethyl, fluorine, chlorine, bromine; R'' is C_1 to C_8 alkyl, C_6 to C_{10} aryl, substituted alkyl, aryl wherein the substituents are the same as that enumerated for R'; Y is S or O. These compounds have shown activity as insecticides. Such oxime carbamates and phosphates can be prepared from ketones such as those of the formula:



where X is halogen.

3,748,362

PRODUCTION OF 4-NITROSODIPHENYLAMINE

Robert C. Kinstler, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 13, 1970, Ser. No. 27,880
Int. Cl. C07c *87/50*
U.S. Cl. 260—576 7 Claims

N-nitrosodiphenylamine is rearranged to 4-nitrosodiphenylamine of high purity by dissolving it in a water-immiscible non-polar solvent such as toluene and reacting it with a solution of dry HCl in anhydrous methanol, thereby producing 4-nitrosodiphenylamine hydrochloride while dissolving most of the by-product impurities in the toluene, neutralizing the resulting slurry with strong aqueous alkali to a pH above about 11.5, drawing off the toluene solution containing the impurities, and adding a limited quantity of acid to the aqueous residue to precipitate a pure 4-nitrosodiphenylamine therefrom while retaining residual alkali-soluble impurities in solution.

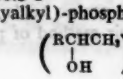
3,748,363

TRIS-(2-HYDROXYALKYL)-PHOSPHINE OXIDES

Ludwig Maier, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Nov. 18, 1970, Ser. No. 90,787, now Patent No. 3,666,543. Divided and this application Feb. 7, 1972, Ser. No. 224,212
Claims priority, application Switzerland, Nov. 24, 1969, 17,554/69; Aug. 31, 1970, 12,973/70
Int. Cl. C07f *9/50*
U.S. Cl. 260—606.5 P 6 Claims

Tris-(2-hydroxyalkyl)-phosphine oxides of the formula



in which R signifies an alkyl group having 1 to 6 carbon atoms and having 0–6 halogen substituents are provided. A process for preparing these phosphine oxides and the use thereof as flameproofing agents are disclosed.

3,748,364

DIETHER SULFONES

Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Original application Feb. 8, 1967, Ser. No. 614,540, now Patent No. 3,556,714, dated Jan. 19, 1971. Divided and this application Aug. 14, 1970, Ser. No. 63,932

Int. Cl. C07c *147/02*

U.S. Cl. 260—607 A **5 Claims**

Unsymmetrical sulfones of the structure:

(a) $R'O-\underset{\displaystyle R'''}{\underset{|}{CH}}-CH_2-SO_2-CH_2-CH_2-OR''$

wherein R' and R'' are H, alkyl groups from 1 to 5 carbon atoms, or alkanoyl groups from 2 to 6 carbons, R''' is alkyl, substituted alkyl or aryl, and

(b) $CH_2\!\!<\!\!\underset{O}{}\!\!>\!\!CH-CH_2SO_2CH_2CO_2R''$

wherein R'' is defined above.

Reaction of sulfones with cellulosic textile materials in two steps under different reaction conditions to obtain crosslinked cellulosic materials having improved crease recovery properties.

ERRATA

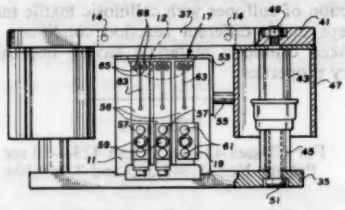
For Classes 423—113 and 423—10 see:
Patents Nos. 3,748,095 and 3,748,104

3,748,365

ELECTRON BEAM HEATING SYSTEM

Kazumi N. Tsujimoto, El Cerrito, Calif., assignor to Airco, Inc., New York, N.Y.

Filed May 26, 1972, Ser. No. 257,429
Int. Cl. H05b *7/00*
U.S. Cl. 13—31 **4 Claims**



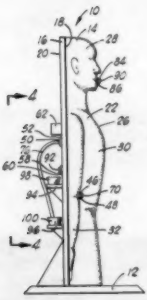
An electron beam heating system for an electron beam furnace is described in which material contained within a skulled crucible is heated. At least four and less than nine elongated fialments of thermionically emissive material are supported parallel with each other within an elongated open-sided channel defined by a focusing electrode. The filaments extend along the length of the channel and are spaced from the focusing electrode. The filaments are heated and electrons emitted thereby are accelerated by an accelerating electrode.

3,748,366

TEACHING AID FOR DEMONSTRATING DRUG CIRCULATION OR THE LIKE IN HUMAN BODY

James R. Rader, 631 S.E. 26th, Edmond, Okla., and Paul W. Smith, 3812 Meadowbrook, Lawton, Okla.

Filed Sept. 30, 1971, Ser. No. 185,033
Int. Cl. G09b *23/28*
U.S. Cl. 35—17 **8 Claims**



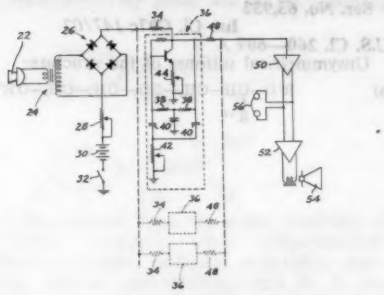
A teaching aid to demonstrate circulation of a drug or the like through the organs of the body the drug being administered either orally or intravenously, and which includes a transparent model of the upper portion of a human body including a head portion, body portion and a pair of arms. Transparent conduits interconnect a plurality of model organ members including a heart member, brain member, liver member, kidney member and stomach member. Another conduit interconnects the mouth of the heat portion and the stomach member. A valve for controlling flow through the transparent conduits is also disclosed.

3,748,367

PERCUSSIVE MUSICAL INSTRUMENT WITH TRANSDUCER FOR ACTUATING AN ELECTRONIC TONE GENERATOR

Stephen J. Lamme, 8585 S.W. Canyon Ln., and Thomas J. Holce, 8155 S.W. Ernst Rd., both of Portland, Oreg.

Continuation-in-part of Ser. No. 72,688, Sept. 16, 1970, abandoned. This application Oct. 21, 1971, Ser. No. 191,488
Int. Cl. G10h *3/00, 5/00*
U.S. Cl. 84—1.04 **8 Claims**



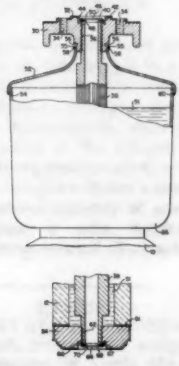
A microphone is positioned adjacent a playing member capable of being struck with drum sticks, foot-operated beaters, or the like. The electric output of the microphone, in response to such striking, is rectified and added to the electric potential supplied to an electronic audio tone generator, to activate the latter and produce a desired tone. The generated tone is amplified and fed to an audio speaker, headphone, recording instrument, or other audio output device.

3,748,368

ELECTRICAL BUSHING ASSEMBLY

Kou Chi Lin, Sharon, and LeRoy E. Dobson, Jamestown, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1972, Ser. No. 292,241
Int. Cl. H01b *17/26*
U.S. Cl. 174—12 BH **8 Claims**



Electrical bushing assembly having a cap nut, an expansion cap, a condenser tube, and a lower support nut all constructed of an aluminum material. The ends of the condenser tube are beveled and are welded to lips located on the cap and support

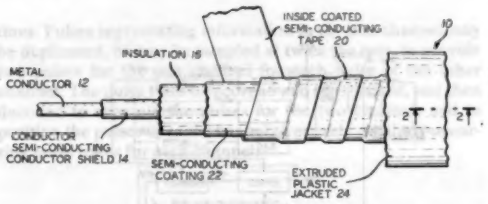
nuts. The expansion cap is welded to a lip around the outside of the cap nut. Grooves around the lips divert the direct conduction of welding heat to plated or coated surfaces on the cap and support nuts. The welding heat required is relatively small due to the thinness of the lips.

3,748,369

METHOD OF SHIELDING HIGH VOLTAGE SOLID DIELECTRIC POWER CABLES

Manuel A. Durakis, Brooklyn; David A. Silver, Roslyn, both of N.Y., and Frank P. Destito, Little Silver, N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Mar. 8, 1971, Ser. No. 121,686
Int. Cl. H01b 9/02
U.S. Cl. 174—36 **11 Claims**



This insulation shielding for high voltage solid dielectric power cables includes a semi-conducting tape helically wrapped on the cable with overlapping convolutions. Voids that exist along the edges of the overlaps are bridged by semi-conducting coating sprayed, dipped, washed, wiped or otherwise applied substantially uniformly in thickness around the circumference of the insulation and lengthwise thereof. This bridging of the voids on the inner side thereof prevents corona in the voids and increases the voltage rating of the cable. The coating is bonded to the tape much more strongly than it is to the insulation so that the coating is pulled off the insulation when the tape is removed for terminations. The invention includes method aspects of applying the coating and the tape wrapping.

3,748,370

SPACER-DAMPER FOR CONDUCTORS OF OVERHEAD ELECTRIC LINES

Piero Dalla, Varese, Italy, assignor to S.A.S. Officine Meccaniche Innocente Riganti di Innocente e Franco Riganti, Solbiate Arno, Italy

Filed July 20, 1972, Ser. No. 273,512
Claims priority, application Italy, Sept. 7, 1971, 28291 A/71
Int. Cl. H02g 7/14, 7/12
U.S. Cl. 174—42 **20 Claims**

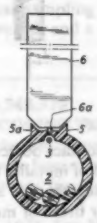
A spacer for conductors of overhead electric lines has a rigid frame on which two or more arms are mounted equally spaced from each other. Corresponding to each arm, there is provided an elongated polygonal bar mounted on the frame. Each arm has a ring member having an inner surface arranged so as to substantially surround the bar — the inner surface having a polygonal cross-section with each corner of the inner surface being arranged opposite a different side of the bar. Rubber members are placed between the sides of the bar and the inner surface so as to resiliently support the arm on the bar and while the rubber members deform permit movement of the arm while being urged to a predetermined position by the restoring forces of the deformed rubber members.

3,748,371

INSULATED CABLE WITH WIRE FOR SLITTING A PROTECTIVE SHEATH

Otto Erik Krook, Hagersten, and Sven Sigurd Nordblad, Spanga, both of Sweden, assignors to Telefonsktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 18, 1972, Ser. No. 254,422
Int. Cl. H01b 7/00; H02g 1/12
U.S. Cl. 174—70 R **5 Claims**



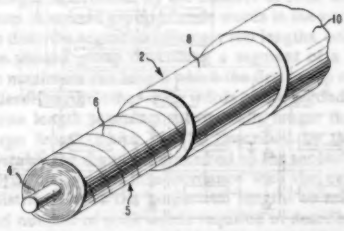
A cable having an outer protective covering or sheath enclosing one or more insulated conductors and a cutting wire or rip cord intended for slitting the covering, the cutting wire being located under a longitudinal notch on the inner side of the covering with the position of the cutting wire being marked on the outer surface of the covering, the marking having the form of a longitudinal notch or two parallel ridges.

3,748,372

ELECTRICAL CABLE WITH POLYMER-OIL INSULATION

Eugene Joseph McMahon; John Oliver Punderson, both of Wilmington, and William Paul Vitcusky, Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1970, Ser. No. 79,588
Int. Cl. H01b 7/18
U.S. Cl. 174—102 R **26 Claims**



The dissipation factor of oil-filled polymer tape insulation is reduced when the affinity of the oil and the polymer for one another is increased. For example, addition of a small amount of silicone oil to polybutene oil increases the affinity of the

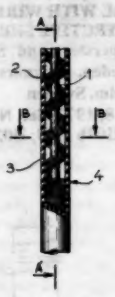
polybutene oil for the polymer and electrostatic treatment of the polymer surface increases the affinity of the polymer for the oil. These approaches can be used separately or in combination. The resultant insulation is useful as insulation between the current carrying conductors of electrical cable.

3,748,373

ELECTRICAL CONTACT DEVICE

Roger Remy, 17 & 35 D'Estienne d'Orves, Neuilly-Plaisance 93, France

Filed Apr. 14, 1972, Ser. No. 244,122
Int. Cl. H01b 7/22
U.S. Cl. 174—115 **4 Claims**



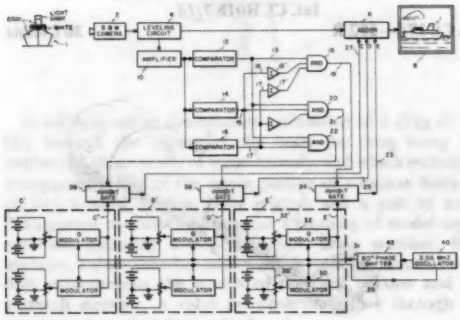
A linear electrical contact device comprising a central conductor, a tubular braid of metallic threads, and a tubular braid of interwoven insulating threads separating the central conductor and the tubular braid of metallic threads. The tubular braid of intermoven insulating threads forms a cord helically wound around the central conductor and is thermo-welded to the central conductor so as to be permanently secured thereto. The contact device can be used in combination with a vehicle window slide to activate when an object is caught in the window as the window is rolled up.

3,748,374

MULTI-COLOR PERISCOPE VIEW SIMULATOR

William J. Curran, Orlando, and John J. Kulik, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 7, 1972, Ser. No. 224,165
Int. Cl. H04n 7/18, 9/04
U.S. Cl. 178—6.8 **1 Claim**



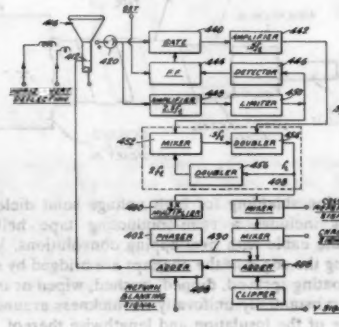
The necessity for using expensive color cameras in a TV system to display colored foreground (and/or background) objects is avoided. A plurality of foreground objects to be displayed are colored various shades of gray and are observed by black and white TV cameras. The invention processes the camera video output signals so that they cause a color TV monitor to display the foreground objects in selected colors in a composite picture comprising a background and one or more foreground objects. The invention can be used to color the background scene as well.

3,748,375

TELEVISION IMAGE-DISPLAY SYSTEM

David E. Sunstein, 464 Conshohocken State Rd., Bala-Cynwyd, Pa.

Filed Oct. 8, 1971, Ser. No. 187,741
Int. Cl. H04n 9/24
U.S. Cl. 178—5.4 F **10 Claims**



In a color television image-display system of the type utilizing a screen comprising triplets of vertical phosphor stripes across which the cathode-ray beam is scanned with an intensity controlled by the color television signal to form the color image, and in which index elements are arranged in predetermined geometric configuration with respect to the triplets to provide index signals indicative of beam position, an additional beam-intensity varying signal is applied to the tube in such frequency and phase that the beam intensity is reduced by the additional signal whenever the beam is centered midway between successive color phosphor stripes. In one embodiment, the stripes are spaced apart from each other and the spaces are occupied by a black material producing negligible light emission in response to beam impingement. In such case, beam current is normally wasted during impingement of the spaces between stripes, and the additional signal utilized in accordance with the invention to reduce the beam intensity at such times results in a net saving in beam current. In another preferred form, the stripes are contiguous or nearly so, and the additional signal reduces the beam intensity on, and adjacent, the lines between successive stripes so as to minimize "cross talk" between stripes. The additional signal for this purpose is preferably derived from the indexing signal by appropriate frequency multiplication and phasing.

3,748,376

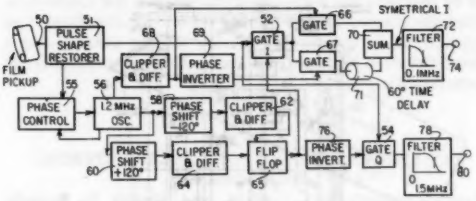
RECORDING SYSTEM FOR COLOR VIDEO SIGNALS

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 15, 1971, Ser. No. 189,696
Int. Cl. H04b 1/04; H04j 3/02; H04h 5/84
U.S. Cl. 178—5.4 CD **13 Claims**

Color signal recording of two channel color information, wherein one channel provides substantially more information than the other channel. The information is converted to a train

of pulse width modulated pulses to contain the information, and with the train including more pulses for the one channel than for the other; such as two pulses for the one channel for each pulse of the other channel. Regularly recurring pulses for the two channels are shifted in phase to produce a combined pulse train in which the pulses are at regularly spaced positions. Pulses representing information in the one channel may be duplicated, or may be sampled at twice the rate, to provide two pulses for the one channel for each pulse of the other channel. The pulse train is recorded and reproduced, and then decoded to separate the pulses for the two channels and to position the pulses in each channel to provide regularly occurring pulse trains for each channel.



3,748,377

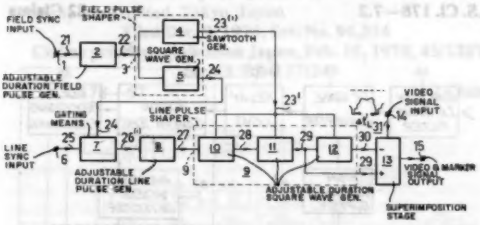
CIRCUIT ARRANGEMENT FOR PRODUCING AN UNAMBIGUOUS MARKER IN A TELEVISION IMAGE

Anne Hendrik Bruinsma, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 23,327, March 27, 1970, abandoned. This application Mar. 1, 1972, Ser. No. 231,053

Int. Cl. H04n 5/00

U.S. Cl. 178—5.4 R **9 Claims**



A circuit arrangement for producing a marker in a television image. The circuit arrangement is provided with a line and field pulse generator of adjustable pulse duration and synchronized at the line and field frequencies, which generators are connected to a line and a field pulse shaper which series arrangements of pulse generator and pulse shaper are coupled together through a gating circuit by means of which a series of line frequency pulses occurring at field frequency is produced. The line pulse shaper is formed with at least two series-arranged square-wave signal generators of varying pulse duration and for obtaining said variation a second input of each square-wave signal generator is coupled to the field pulse shaper providing a signal varying as a function of time.

3,748,378

FLAT PANEL VIDEO DISPLAY DEVICE

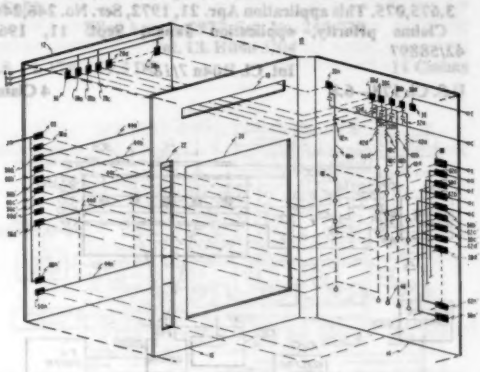
Arthur D. Garrison, and Earl L. Hall, both of Fort Worth, Tex., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,198

Int. Cl. H04n 9/12

U.S. Cl. 178—5.4 R **18 Claims**

A flat panel video display device utilizes the normal glow discharge characteristics of gases to perform the switching functions for sequentially sampling and storing and then displaying the video signal. The device consists of a flat, sealed envelope which contains therein chambers filled with an ionizable gas and the signal sampling and storage circuits, horizontal line switching circuits, and a display matrix of light emitting elements.



3,748,379

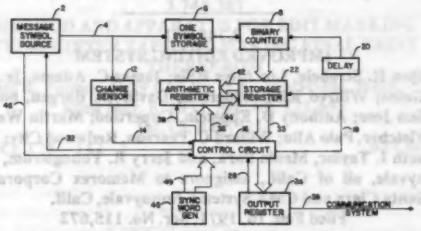
RUN LENGTH CODING TECHNIQUE

Paul Epstein, Brookline; Robert E. Wernikoff, Belmont; James E. Cunningham, and George Rosen, both of Brookline, all of Mass., assignors to Electronic Image Systems Corporation, Cambridge, Mass.

Filed Jan. 22, 1970, Ser. No. 4,902

Int. Cl. H04n 7/18

U.S. Cl. 178—6 **22 Claims**

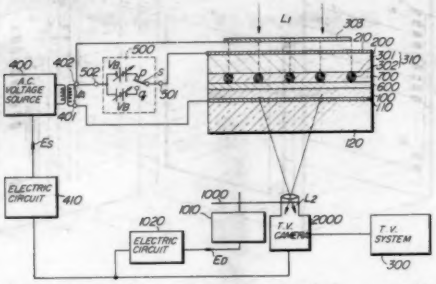


In run length coding sequences of message symbols, a first group of code words in the code word vocabulary is used to describe a group of consecutive run lengths of from one to a maximum length determined by the number of code words in the first group. A second group of code words in the vocabulary is used to describe segments of longer run lengths, one code word of the second group describing a segment of a length equal to the maximum run length which the first group of code words can describe, the other code words of the second group describing run length segments substantially longer than the maximum run length which can be described by the first group. Preferably the segments described by the second group of code words are chosen in accordance with the expected statistical distribution of the longer run lengths to minimize the expected number of code words required to describe such longer sequences of message symbols. One notable feature of the technique is that any length run can be coded in a reasonably efficient fashion, even though its occurrence may not have been foreseen, for the second group of code symbols provides a self-extending coded description.

3,748,380
ENERGY-RESPONSIVE LUMINESCENT DEVICE

Tadao Kohashi, 312 Kitatsunashinmacho, Kohoku-ku, Yokohama, Japan

Division of Ser. No. 758,058, Sept. 6, 1968, Pat. No. 3,675,075. This application Apr. 21, 1972, Ser. No. 246,244
Claims priority, application Japan, Sept. 11, 1967, 42/58897
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 **4 Claims**

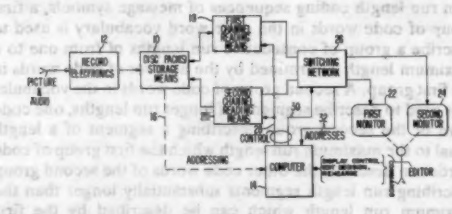


A solid-state electroluminescent image display device which produces the output thereof in response to an image of the light, X-ray or other types of energy projected on to said device, said output being able to be controlled by varying a DC bias voltage for said device, and which comprises an electroluminescent layer excited by an AC electric field and controllable by a DC field and an energy-responsive layer whose resistivity varies in response to the incident energy such as a photoconductive layer, said two layers being interposed between a first light-pervious electrode and a second electrode in such a manner that the electroduminescent layer is adjacent to said first electrode, a third or composite electrode placed between said two layers, the AC exciting voltage being connected between said first and third electrodes and the DC bias voltage between said second and third electrodes.

3,748,381
IMPROVED EDITING SYSTEM

Caljon H. Strobele, Los Altos Hills; James C. Adams, Jr., Los Gatos; Wilfred King Anderson; David W. Bargen, both of San Jose; Anthony D. Eppstein, Cupertino; Martin Wallace Fletcher, Palo Alto; Willard C. Pearson, Redwood City; Kenneth I. Taylor, Menlo Park, and Jerry R. Youngstrom, Sunnyvale, all of Calif., assignors to Memorex Corporation, Santa Clara and CMX Systems, Sunnyvale, Calif.

Filed Feb. 16, 1971, Ser. No. 115,672
Int. Cl. H04n 5/76
U.S. Cl. 178—6.6 A **40 Claims**

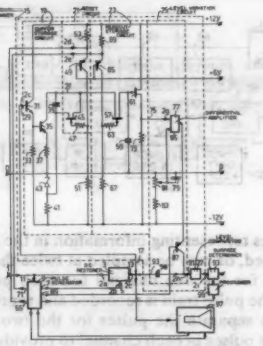


A system for recording samples of video information signals as a plurality of magnetic recording discs is provided, for use, for example, as an automatic television editing system. Audio information signals are recorded along with the video samples. Means are provided for reproducing the original video information signals by duplicating the sampled video signals. Means are also provided for reproducing the corresponding audio signals.

3,748,382
VIDEO CONTOUR DETERMINING CIRCUIT

Hantje Reitsma, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 29, 1971, Ser. No. 167,238
Int. Cl. H04n 5/14
U.S. Cl. 178—7.1 **5 Claims**

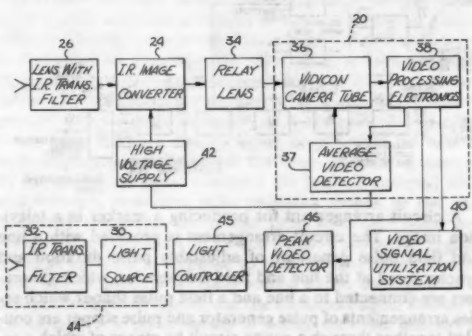


A circuit for extracting contour information from a video signal having an irregular background signal has a buffer storage circuit for supplying a signal that is dependent upon the video signal of a previous line scan. A read-out circuit supplies a D.C. signal dependant upon said buffer storage signal for setting the black level of the video signal so that the backg round level is subtracted out.

3,748,383
CAMERA SYSTEM FOR DAY AND NIGHT USE

Robert Grossman, P.O. Box 24649, Los Angeles, Calif.

Filed Apr. 5, 1971, Ser. No. 131,109
Int. Cl. H04n 5/30
U.S. Cl. 178—7.2 **22 Claims**

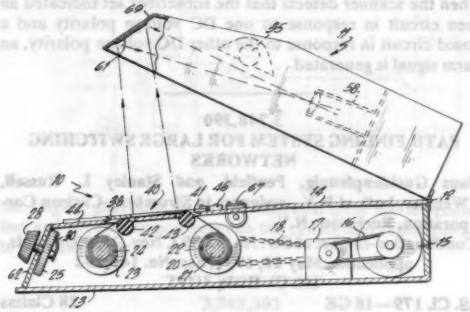


A camera system for day and night use whereby a picture of good quality and contrast may be obtained with lighting ranging from full sunlight to complete darkness without manual adjustment of the camera. The camera is made sensitive to infrared light and the field of view of the camera is illuminated with infrared light in response to the intensity of the light being received by the camera from its field of view, and particularly from the darkest areas of its field of view. For a film camera, an infrared image converter is generally used to convert the infrared image to a visual image. In a television camera system, the camera tube may be responsive to infrared light, or an image converter tube may be used. Embodiments of television systems are disclosed wherein a plurality of control loops are used so as to control both brightness and contrast in the picture, such as a control loop to control the voltage on the image converter tube, and another loop to control the voltage on the camera tube.

3,748,384
CLOSED CIRCUIT TELEVISION PROMPTING DEVICE

Alvin S. Eisenberg, Little Neck, N.Y., assignor to Q-TV, Inc., New York, N.Y.

Filed Jan. 17, 1972, Ser. No. 218,138
Int. Cl. H04n 5/24
U.S. Cl. 178—7.2 5 Claims

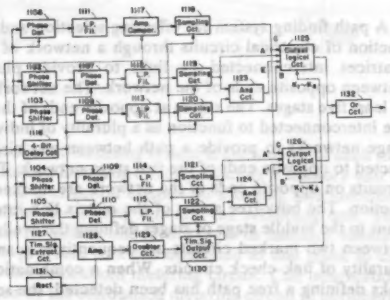


Spaced script display panels are carried within a housing which also supports two television cameras. Each panel is disposed within the field of one of the cameras. Drive means associated with each panel permits the operator to move a script across each panel at a desired speed. One or both of the cameras may be activated to produce an image of the script in the field of the camera upon a television display screen.

3,748,385
DATA SIGNAL TRANSMISSION SYSTEM EMPLOYING PHASE MODULATION

Yoshimitsu Okano, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Dec. 9, 1970, Ser. No. 96,314
Claims priority, application Japan, Feb. 10, 1970, 45/12078
Int. Cl. H04l 27/24
U.S. Cl. 178—67 2 Claims

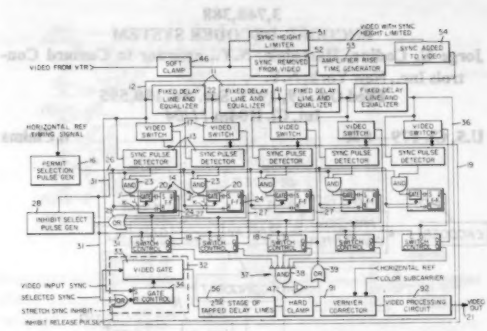


A data signal transmission system employing phase and amplitude deviation information comprising a transmitter including a source of an input data serial binary signal having a predetermined number of bits; means for converting the data signal into a plurality of parallel pulse signals, each representing one data signal bit, modulating means for phase deviating a carrier signal different angular amounts and indicating resultant vectors of combined vectors corresponding to phase deviations of the respective parallel pulse signals, and means for serially combining the carrier signal as phase deviated different amounts together with the resultant vectors to represent the input serial data signal; and a receiver including means demodulating the received serially combined phase deviated carrier signal together with the resultant vectors to reproduce the transmitter input data serial binary signal.

3,748,386
TIME-BASE ERROR CORRECTION SYSTEM

Daniel L. Monney, 633 Farley St., Mountain View, and William F. Herzog, 404 E. Shamrock Dr., Campbell, both of Calif.

Filed Apr. 3, 1972, Ser. No. 240,729
Int. Cl. H04n 5/04
U.S. Cl. 178—69.5 DC 11 Claims

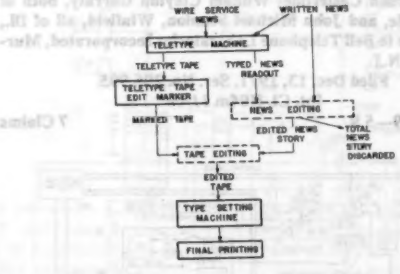


A time-base error correction system for a video signal employing a plurality of serially connected delay lines. Circuit means are conditioned to detect the closest timing match between a reference synchronizing signal and the video signal as it appears at various points along the delay path and to connect the appropriate delay line point or junction to an output at which the correctly delayed video signal appears. Featured circuitry provides for eliminating the erroneous leading edge of a video synchronizing pulse distorted by changes in the selected delay point and for compensating for variations in d.c. offset of the video signal introduced by differential delay line path effects.

3,748,387
METHOD AND APPARATUS FOR EDIT MARKING TELEPRINTER TAPE AND MAKING FINAL PRINT THEREFROM

Donald R. Palmer, 5629 61st Dr. N.E., Marysville, Wash.

Filed Mar. 8, 1971, Ser. No. 121,688
Int. Cl. B41j 5/38
U.S. Cl. 178—112 52 Claims



A teletype tape edit marking apparatus which marks on a teletype tape the location of each punctuating period and each paragraph separation. This apparatus has a tape reader connected to a logic circuit which ascertains (a) a bite pattern corresponding to periods and (b) a sequence of three bite patterns corresponding to a paragraph separation. The logic circuit in turn activates either a period marker or a paragraph marker for the tape.

In the method of the present invention, the teletype machine produces a teletype tape and a separate news prin-

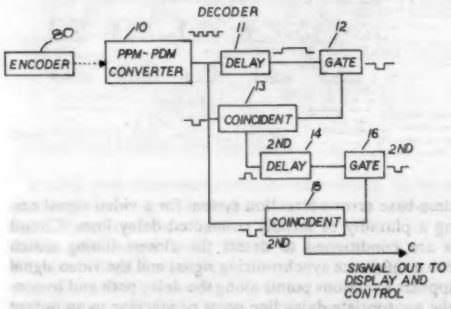
tout. The news printout is edited (e.g., by deleting certain paragraphs or sentences) in a conventional manner. The selected matter from the news printout is compared to the edit marked tape, and corresponding paragraphs and sentences are selected from the tape, with the deleted matter simply being physically removed (e.g. by cutting) from the tape. Then the tape is fed into a type setting machine which produces type suitable for final printing.

3,748,388

ENCODER-DECODER SYSTEM

Jorge G. Codina, Hartsdale, N.Y., assignor to Comard Controls Inc., New York, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,595
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R **6 Claims**



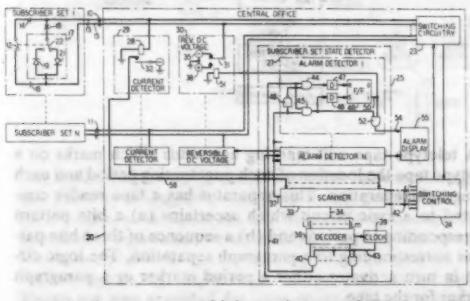
In combination with a plurality of encoders each of which can generate a different pulse duration coded (PDC) signal which uniquely identifies it: a converter responsive to incoming PDC signals supplied thereto from the encoders to derive therefrom corresponding pulse position coded (PPC) signals which also uniquely identify the corresponding encoders; first means to supply said PDC signals from said encoders to said converter; a like plurality of decoders each of which is adapted to respond to the presence of the PPC signal which uniquely identifies the encoder corresponding to it to produce an output signal, each decoder being non-responsive in the absence of the unique identifying signal; and second means to supply said PPC signals from said converter to all of said decoders in parallel.

3,748,389

ALARM DETECTION SYSTEM

Russell Carson Casterline; William Clayton Garraty, both of Naperville, and John Michael Scanlon, Winfield, all of Ill., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1971, Ser. No. 206,995
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R **7 Claims**



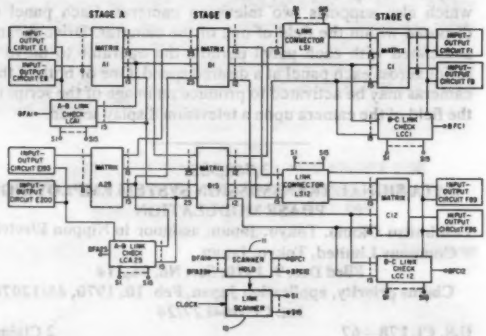
A telephone system which employs an alarm detection arrangement is disclosed. Each subscriber set of the telephone system includes a subscriber set switch connected between an associated pair of conductors and an alarm indicator which replaces the subscriber set switch in response to an alarm situation. A central office, which applies a first polarity of DC voltage between each pair of conductors, responds to the opening or closing of the subscriber set switch and the replacement of the subscriber set switch with the alarm indicator by reversing the voltage polarity between the conductors. When the scanner detects that the subscriber set indicated an open circuit in response to one DC voltage polarity and a closed circuit in response to the other DC voltage polarity, an alarm signal is generated.

3,748,390

PATH FINDING SYSTEM FOR LARGE SWITCHING NETWORKS

Klaus Gueldenpfennig, Penfield, and Stanley L. Russell, Webster, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 92,593, Nov. 25, 1970. This application May 20, 1971, Ser. No. 145,292
Int. Cl. H04q *3/495*
U.S. Cl. 179—18 GE **28 Claims**



A path finding system for effecting selection and interconnection of electrical circuits through a network of switching matrices interconnected by links to provide plural paths between opposite ends of the network. The network includes at least five stages. The stages at opposite ends of the network are interconnected to function as a plurality of individual two stage networks to provide a path between any circuits connected to opposite ends of the two stage network. Two of the circuits on opposite ends of the network are marked for connection. The busy-free status of the matrix link interconnections to the middle stage or stages defining the available paths between two marked circuits are sequentially scanned by a plurality of link check circuits. When a combination of free links defining a free path has been detected, the scanning is stopped and the connection through the network is completed via the free links.

3,748,391

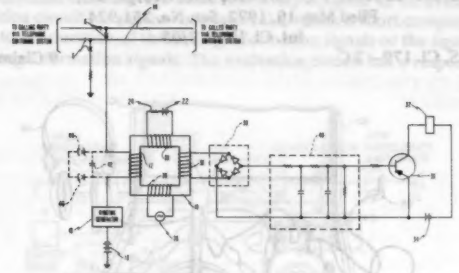
TELEPHONE RING-TRIP CIRCUIT

William E. Shaffer, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,502
Int. Cl. H04q *9/00*; H03k *17/00*
U.S. Cl. 179—84 R **12 Claims**

Ringing signals are applied to a telephone line through a winding of a saturable reactor which is maintained in a saturated magnetic state until driven out of saturation by a DC current which flows through the telephone line upon completion of a DC current path via the telephone when the handset

is lifted from its cradle. At that time, an AC signal is induced in another winding of the reactor which is used for enabling



the ringing generator to be disconnected from the telephone line and the connection between the calling and called parties to be completed.

3,748,392

CENTRAL METERING SYSTEM FOR AUTOMATIC TELEPHONE EXCHANGES

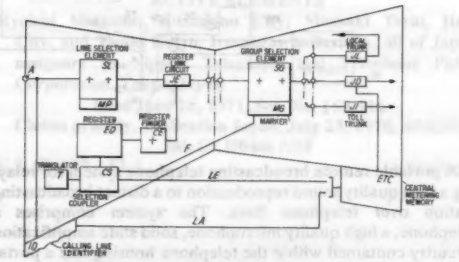
Andre Jean Henquet, and Roger Mugnier, both of Boulogne, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,547

Claims priority, application France, Mar. 26, 1970, 7010892

Int. Cl. H04m *15/10*

U.S. Cl. 179—7 MM **3 Claims**



An automatic toll ticketing system is disclosed. For each toll call, a centralized metering circuit including a memory unit is connected via a selection coupler to a calling line identifier which identifies the calling line and the recording unit. The unit transfers the calling line identity into its memory. Identity of a trunk is provided to a cell dedicated to that trunk in the memory of the centralized metering circuit. Call information is transmitted by the centralized metering circuit to peripheral memory apparatus at the end of a call.

3,748,393

DATA TRANSMISSION OVER PULSE CODE MODULATION CHANNELS

John Vivian Baxter, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

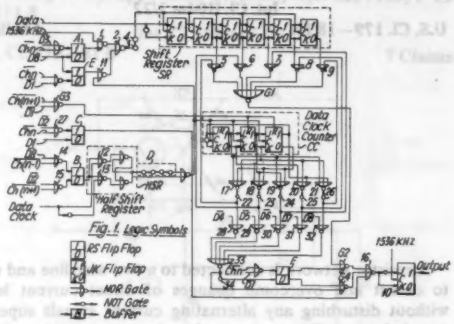
Filed Jan. 18, 1971, Ser. No. 107,210

Claims priority, application Great Britain, Feb. 17, 1970, 7,530/70

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 AF **10 Claims**

An arrangement to substitute data bits for and extract these data bits from at least one channel of a PCM-TDM intelligence (voice) communication system. The data bits do not have to be synchronized with the normal PCM bit stream. The normal PCM bit stream employs n bit positions, one bit position being employed for signalling and/or synchronization and $(n-1)$ bit positions being employed for conveying intelligence. Data bits equal to or less than $(n-2)$ are substituted for intelligence in a selected PCM channel. The data bits are grouped



at one end of the $(n-1)$ bit positions and a marker bit is inserted into a bit position adjacent the last data bit. The location of the marker bit in the $(n-1)$ bit positions indicates the number and repetition rate of the data bits. The position of the marker bit within the $(n-1)$ bit positions is employed in the receiver to extract the data bits from the PCM bit stream and to return the data bits to their original repetition rate for further utilization.

3,748,394

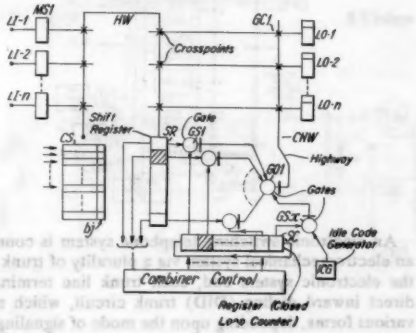
CONFERENCE FACILITIES FOR A TDM EXCHANGE

David Michael Thomas, Ottawa, Ontario, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 853,134, Aug. 26, 1969. This application Oct. 6, 1971, Ser. No. 187,140

Int. Cl. H04m *3/56*

U.S. Cl. 179—18 BC **4 Claims**

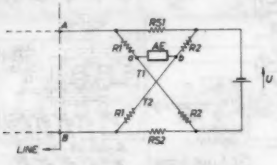


Conference facilities are provided in a Time Division Multiplex telephone system. The conference facilities include a scanner which scans channels participating in a conference call to determine which ones are actually carrying speech signals and to route any such signals to each of the other participants in the conference call. The scanner expressly avoids the transmission of speech back to the line being sensed in order to avoid excessive side-tone.

3,748,395
D.C. MONITOR CIRCUIT

Eberhard Herter, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 555,913, June 7, 1966, Pat. No. 3,525,816. This application June 2, 1970, Ser. No. 42,763
Claims priority, application Germany, June 7, 1966, ST 24001The portion of the term of this patent subsequent to Aug. 25, 1987, has been disclaimed.
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FA 14 Claims

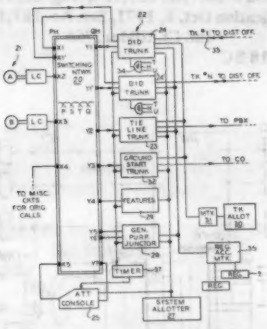


A resistor network is connected to a two wire line and used to detect and overcome changes of direct current levels without disturbing any alternating current signals superimposed thereon. Direct connections between the d.c. source and the network eliminate the effects of any fluctuations in the source voltage. The invention has general utility wherever changes in d.c. levels must be detected; however, a particular use of the invention is to compensate for longitudinal voltages induced on a telephone line.

3,748,396
DIRECT INWARD DIALING TRUNK CIRCUIT

Alfred M. Hestad, Chicago; Benjamin R. Marbury, Oak Lawn, both of Ill.; Hector O. Medina, Buenos Aires, Argentina, and Donald L. Neel, Lombard, Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 14, 1971, Ser. No. 133,909
Int. Cl. H04m *3/38*
U.S. Cl. 179—18 DA 16 Claims

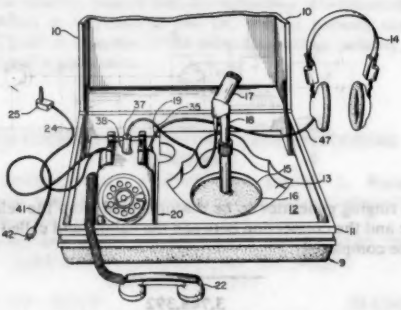


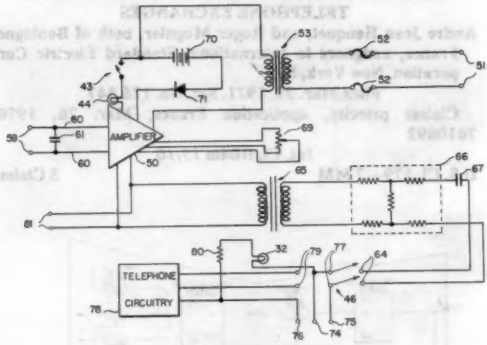
An electronic switching telephone system is connected to an electromechanical system via a plurality of trunk lines. At the electronic system end, each trunk line terminates in a direct inward dialing (DID) trunk circuit, which may take various forms, depending upon the mode of signaling used. In addition, a subscriber who either receives or makes a trunk call may hold the trunk call and locally call a second subscriber for a conference or transfer the trunk call to a second subscriber. Toll calls may be restricted to certain subscriber lines, with means for precluding a fraudulent defeat of the restrictor means. A particularly useful feature of the DID trunk circuit is its ability to direct an originated call into either side of the network. This way, the trunk circuit may operate more efficiently than it would operate if all calls had to originate on one side of the network.

3,748,397
PORTABLE REMOTE BROADCASTING TELEPHONE SYSTEM

Clarence E. Jones, P.O. Box 458, Saint George, S.C.

Filed May 10, 1972, Ser. No. 251,924
Int. Cl. H04h *1/08*
U.S. Cl. 179—2 C 9 Claims





A portable remote broadcasting telephone system for relaying a high quality sound reproduction to a distant broadcasting station over telephone lines. The system comprises a telephone, a high quality microphone, solid state amplification circuitry contained within the telephone housing and a portable carrying case. A double-pole double-throw switch selectively connects the amplification circuitry and the telephone to the telephone lines and, irrespective of the position of the switch, permits the presence of an incoming call to be detected. The microphone is coupled to the amplifier through a plug and jack connection, which, when made, prevents the inadvertant use of the telephone handset in disconnecting the telephone.

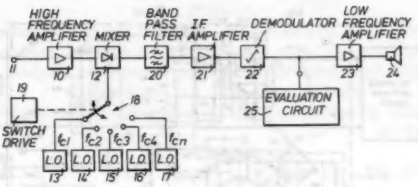
3,748,398
CIRCUIT ARRANGEMENT FOR DETERMINING THE EXISTENCE OF A CALLING CONDITION ON CHANNELS OF A MULTIPLEX RADIOTELEPHONE COMMUNICATION SYSTEM

Klaus Dieter Schenkel, Ay, Iller, and Friedhelm Hillebrand, Ulm, Danube, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 13, 1971, Ser. No. 188,814
Claims priority, application Germany, Oct. 13, 1970, P 20 50 116.0
Int. Cl. H04m *11/00*
U.S. Cl. 179—41 A 9 Claims

A circuit arrangement responsive to dialing information signals and signaling information signals and for determining a

calling condition on a channel of a frequency multiplex radiotelephone communication system. Switching means are provided for cyclically switching a receiver means to individual channels of the communication system. The individual channels are each effectively coupled to an evaluation circuit for a given time interval t_a which is short compared to the duration of the dialing information signals or the signaling information signals. The evaluation circuit has a response



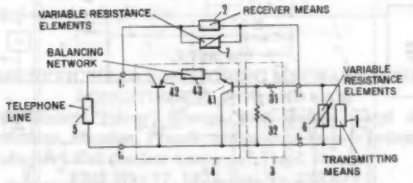
time less than the time interval t_a which is short compared to the duration of the dialing information signals or the signaling information signals. The evaluation circuit has a response time less than the time interval t_a and determines whether each of the individual channels is free or occupied, the evaluation circuit being effective for detecting dialing information signals or signaling information signals thereby determining the presence of such signals.

3,748,399

TELEPHONE NON-COIL HYBRID CIRCUITS UTILIZING ACTIVE ELEMENTS

Ryoichi Matsuda, Musashino City; Masaaki Terai, Hoya City, and Yasuo Hojyo, Irumagawa, Sayama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed June 16, 1971, Ser. No. 153,516
Claims priority, application Japan, July 23, 1970, 45/63934
Int. Cl. H04m *1/58*
U.S. Cl. 179—81 A 11 Claims



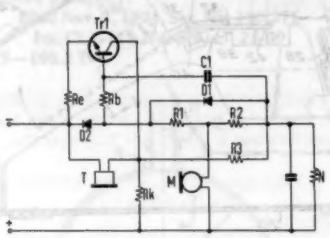
In a telephone circuit of the class comprising a transmitter and a receiver connected to a subscriber's line, there are provided a voltage divider connected to the transmitter for dividing the voltage of the signal transmitted by the transmitter, an amplifier connected between the voltage divider and the subscriber's line for supplying thereto an AC current propotional to the voltage divided by the voltage divider, the receiver being connected across the juncture between the transmitter and the voltage divider and the juncture between the amplifier and the subscriber's line, a first variable impedance element connected across the transmitter, and a second variable impedance element connected across the receiver, the first and second variable impedance elements varying their impedances in accordance with the DC voltage across the subscriber's line.

3,748,400

CIRCUIT ARRANGEMENT FOR ATTENUATION COMPENSATION IN TELECOMMUNICATION SUBSCRIBER STATIONS

Hermann Ritz; Hans Gorlitz, and Anneliese Jendis, all of Munich, Germany, assignors to Siemens & Halske Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 26,536, April 8, 1970. This application July 20, 1972, Ser. No. 273,536
Claims priority, application Germany, Apr. 15, 1969, P 19 19 111.8
Int. Cl. H04m *1/00*
U.S. Cl. 179—81 B 7 Claims



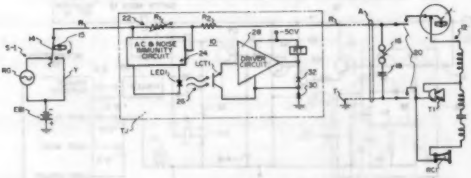
The invention is related to a circuit arrangement for centrally supplied subscriber stations in telecommunication installations. In the inventive circuit the recieving amplifier is connected into a bridge circuit used for side-tone attenuation. The signal input of the receiving amplifier is located in the one diagonal of the bridge, and the output of the transmitter is located in the other diagonal of the bridge circuit. A variable resistance element is connected in parallel with the bridge diagonal across which the signal input to the receiving amplifier appears for compensating for the different attenuation affects of transmission lines having differing lengths.

3,748,401

RING TRIP CIRCUIT

Robert G. Pesz, Barrington, and Robert T. Cleary, Lockport, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ind.

Filed June 20, 1972, Ser. No. 264,673
Int. Cl. H04m *3/02*
U.S. Cl. 179—84 R 8 Claims



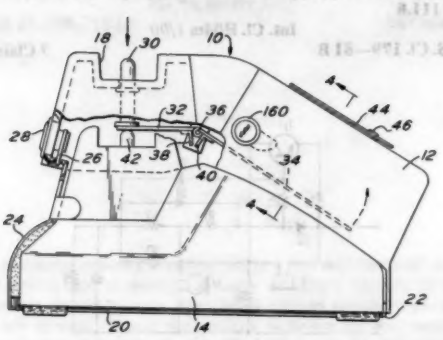
A ring trip arrangement for a ringing circuit including a ring trip relay operation by the conduction of an optical coupler which is operatively responsive to an answered condition. A light emitting diode conducts only in response to the flow of direct current caused by the off-hook condition, and is isolated from the alternating ringing current by an a.c. and noise immunity circuit. A driver amplifier circuit is provided to respond to minimum conduction of the light emitting diode and itself provide the drive to operate the ring trip delay.

3,748,402

APPARATUS FOR PREVENTING THE DIALING OF CERTAIN TELEPHONE NUMBERS

Albert Yussen, Philadelphia, Pa., assignor to Telecommunications Corporation of America, Philadelphia, Pa.

Filed Sept. 27, 1971, Ser. No. 183,930
Int. Cl. H04m 1/66
U.S. Cl. 179—90 D **10 Claims**



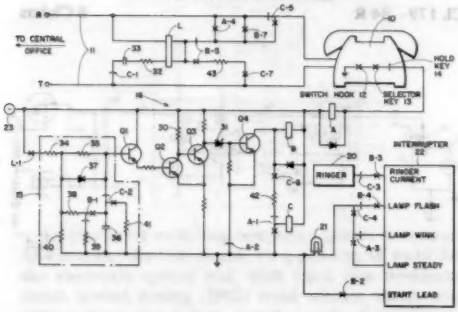
Apparatus for preventing the dialing of toll call telephone numbers using a public utility rotary dial telephone. The apparatus permits local telephone calls to be completed and can be disabled to permit toll calls by a key operated assembly. The apparatus can also be converted into a local call pay telephone.

3,748,403

LINE CIRCUIT FOR A KEY TELEPHONE SYSTEM

Knut Roger Schartmann, Montreal, and Wesley John Warner, Ottawa, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Dec. 15, 1971, Ser. No. 208,251
Int. Cl. H04m 3/22
U.S. Cl. 179—99 **1 Claim**



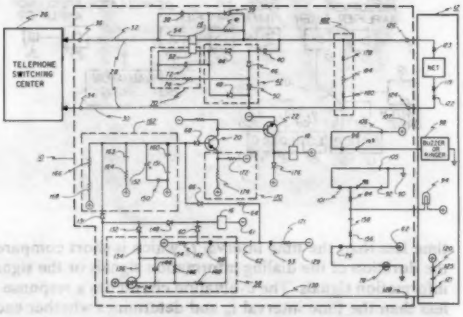
A line circuit for a key telephone system having a common timing circuit which utilizes a single capacitor and a plurality of resistors to derive the various time constants required during the four operating states (idle, ringing, busy and hold) of the system. Contacts, associated with standard control relays used in the line circuit, are utilized to control connections to the resistors to obtain the desired time constants.

3,748,404

TELEPHONE LINE CIRCUIT EMBODYING A TRIGGERABLE AVALANCHE DEVICE

Gordon H. Davis, Canadaigua; Frank Nierlit, Webster, and Bernard H. Root, Palmyra, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,479
Int. Cl. H04m 3/22
U.S. Cl. 179—99 **12 Claims**



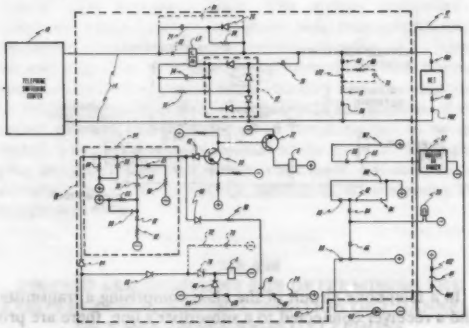
A telephone line circuit for a key telephone system embodying a triggerable avalanche device for placing a telephone line in a hold condition and releasing the line therefrom when a telephone switching system applies a polarity reversal or a line current interruption to the telephone line circuit.

3,748,405

KEY TELEPHONE SYSTEM LINE CIRCUIT

Philip B. Saba, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 15, 1972, Ser. No. 263,342
Int. Cl. H04m 1/00
U.S. Cl. 179—99 **6 Claims**



A key telephone system line circuit provides the supervisory and control functions for initiating and terminating local signalling to a key telephone set and for placing the associated line in and out of hold conditions.

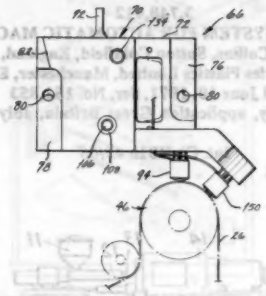
Contacts of the line relay of the line circuit are connected in series with the dummy load placed across the telephone line during hold conditions to provide a positive release of the telephone line in response to a momentary change in line potential generated by the telephone switching center as a result of the outside party hanging up while the line is on hold.

3,748,406

SOUND RECORDING DEVICE WITH COMMONLY LIFTABLE MOUNTING ARMS FOR A PLURALITY OF HEADS WHICH ARE INDIVIDUALLY ADJUSTABLE

Otto A. Rauhut, St. Louis, Mo., assignor to Wide Range Electronics Corporation, St. Louis, Mo.

Filed Feb. 16, 1971, Ser. No. 115,572
Int. Cl. G11b 21/02, 21/12, 21/26
U.S. Cl. 179—100.2 CA 16 Claims



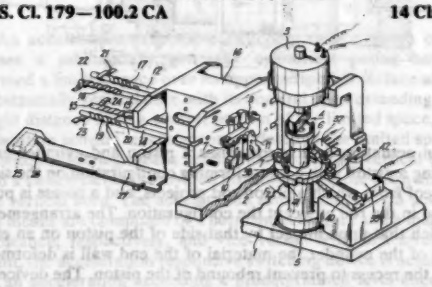
A sound recording device having a fixture for supporting a plurality of recording heads to record a corresponding plurality of sound tracks on a sound record medium. A similarly corresponding plurality of independently movable mounting arm members are disposed in the fixture housing and commonly supported on a single pivot member such that all mounting arm members pivot about the same pivot axis. The recording heads are each secured to an individual mounting arm member such that each recording head is independently movable about the pivot axis toward or away from the sound record medium. The fixture also includes adjustable springs corresponding to each mounting arm member for providing each arm member with a predetermined pivot position about the pivot axis. Adjustable stop members for providing each mounting arm member with a predetermined pivotal stop position are also included in the fixture. Positional adjustments can thus be made to one mounting arm member without effecting the adjusted positions of other mounting arm members. The mounting arm members include arm lifter means provided on one mounting arm member and extending across the other mounting arm members such that the recording head mounting arms can be commonly and collectively pivoted about a single axis.

3,748,407

MAGNETIC HEAD POSITIONING MECHANISM WITH LONGITUDINAL ROD AND CAM

Lucien Robert Prieur, Ecouen, and Hubert Cecyl Albert Rousseau, Meudon, France, assignors to Societe Industrielle Honeywell Bull (Societe Anonyme), Paris, France

Filed May 17, 1972, Ser. No. 255,875
Claims priority, application France, May 25, 1971, 7118809
Int. Cl. G11b 5/44
U.S. Cl. 179—100.2 CA 14 Claims



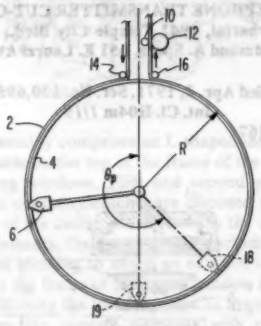
A device for moving a plurality of magnetic heads toward or away from a magnetic storage disc wherein a plurality of such heads simultaneously are moved into and out of operative position on each face of the disc, wherein a rod rotatable around its longitudinal axis is coupled to move each of such heads, wherein a rotatable cam is employed to actuate said heads, and wherein a single cam follower apparatus with the cam to provide for rotation of all of such rods.

3,748,408

TRACKING CONTROL FOR RECORDER-REPRODUCER SYSTEMS WITH THE CONTROL TRANSDUCER LOCATED AT THE NEUTRAL POINT OF THE TAPE STRETCH

Henry Ray Warren, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 8, 1971, Ser. No. 196,271
Int. Cl. G11b 5/48, 15/43, 21/00
U.S. Cl. 179—100.2 T 4 Claims



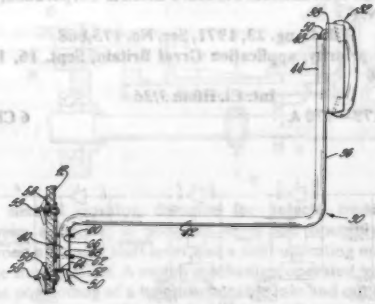
An arrangement for a stationary control transducer in a recorder-reproducer system which minimizes mistracking of transverse extending information tracks by rotatable information transducers. The control transducer is located at the neutral point of stretch of the tensioned web which is transported over a support surface for scanning of the transverse information tracks.

3,748,409

TELEPHONE BRACKET

William E. Stokes, Lakewood, Ohio, assignor to Motivated Images, Inc., Cleveland, Ohio

Filed Dec. 6, 1971, Ser. No. 205,114
Int. Cl. H04m 1/11
U.S. Cl. 179—149 10 Claims



An apparatus for supporting a telephone in a hospital room having an adjustable bed and a privacy curtain therein. In a

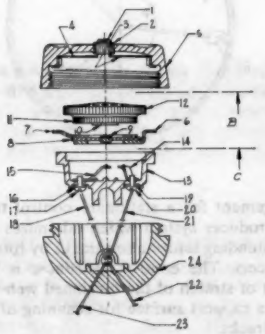
preferred embodiment, the apparatus includes a mounting plate adapted for attachment to a wall of the room, an arm is pivotally attached to the mounting plate and has a first portion extending a predetermined horizontal distance into the room beneath the privacy curtain and at a position below the lowest adjustment level of the bed. A second portion of the arm extends a predetermined vertical distance upward from the first portion. The second portion is configured to engage a surface of the bed to limit swinging movement relative thereto and is adapted for mounting a telephone thereon, whereby a telephone mounted on the second portion may be swingably supported relative to the bed and positionable within easy reach of a patient lying on the bed in all operable positions (raised or lowered) of the hospital bed without interfering with either closing of the privacy curtain or adjustment of the bed.

3,748,410

TELEPHONE TRANSMITTER CUT-OFF

Morries P. Garbarini, 4941 Temple City Blvd., Temple City, Calif., and Edmond A. Spera, 651 E. Laurel Ave., Glendora, Calif.

Filed Apr. 2, 1971, Ser. No. 130,695
Int. Cl. H04m *1/19*
U.S. Cl. 179—167 **7 Claims**



A telephone handset transmitter has a cut-off switch located in the center of the transmitter cap for actuation by a finger of the hand holding the handset; a circuit to the transmitter microphone capsule is blocked by an insulating disc, which completes the circuit through the cut-off switch and related conductors.

3,748,411

CARRIER SUPERVISORY ARRANGEMENTS

Roger Wallace Heyes, Basildon; Malcolm Charles Betts, Ilford, and Helen Barbara Cranswick, Billericay, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 23, 1971, Ser. No. 173,868
Claims priority, application Great Britain, Sept. 16, 1970, 44,179/70
Int. Cl. H04b *3/36*
U.S. Cl. 179—170 A **6 Claims**

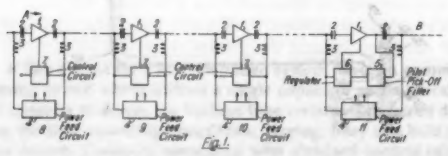


Fig. 1.

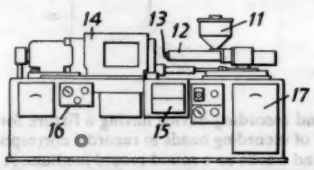
A pilot-controlled transmission system is disclosed for use on communication cables. The pilot-signal is detected at a master repeater station and control pulses indicative of its level are transmitted along the cable in the opposite direction to the signals. The control pulses control slave repeaters, each of which except the last, repeats the control pulses in the opposite direction to the signals. A power pick-off filter at the output of a repeater is arranged to pick off the control pulses and a power pick up filter at the input of a repeater is arranged to apply the control pulses to the cable.

3,748,412

CONTROL SYSTEM FOR AUTOMATIC MACHINES

George Thomas Collins, Sutton Coldfield, England, assignor to British Industries Plastics Limited, Manchester, England

Filed June 10, 1971, Ser. No. 151,853
Claims priority, application Great Britain, July 18, 1970, 34,968/70
Int. Cl. H01h *43/08*
U.S. Cl. 200—46 **5 Claims**



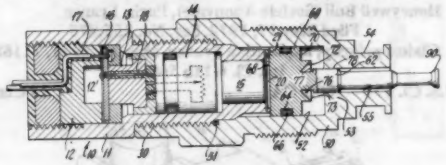
Sequential operation of an automatic machine is controlled by an assembly of binary switches which are selectively operated by a selector member. Plunger operated microswitches may be used in conjunction with a selector member comprising a stiff apertured plate so that when the plate is pressed against an assembly of switches, it depresses the plungers except the ones located against the apertures and thus makes the selection. Lever-operated microswitches may alternatively be used in conjunction with a selector member having a profiled edge which is shaped to engage some levers and not others when it is brought into operational relationship with the switch array.

3,748,413

EXPLOSIVE TYPE CIRCUIT BREAKER WITH FRANGIBLE PRINTED CIRCUIT BOARD

Robert H. Sawyer, Bernardsville, N.J., assignor to Cartridge Actuated Devices, Inc., Fairfield, N.J.

Filed Mar. 1, 1972, Ser. No. 230,837
Int. Cl. H01h *39/00*
U.S. Cl. 200—61.08 **6 Claims**



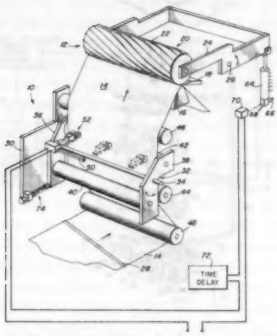
An actuating device comprises a piston and cylinder unit having a piston with a metal forming configuration on the side thereof from which a piston rod projects, and a recess is provided in the rod adjacent the configuration. The arrangement is such that upon impact by that side of the piston on an end wall of the cylinder the material of the end wall is deformed into the recess to prevent rebound of the piston. The device is also illustrated in combination with an explosive operated initiating element.

3,748,414

SELF-CALIBRATING SEAM DETECTOR

William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Filed Nov. 20, 1970, Ser. No. 91,358
Int. Cl. B65h 25/14
U.S. Cl. 200—61.13 2 Claims



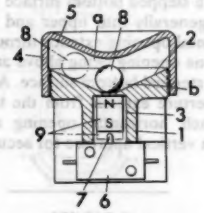
Seams or other protrusions on a running web are detected by a sensor bearing against the web surface. A pair of spaced parallel rollers mounted on a common pivoted bracket engage opposite sides of the web, one roller positioned opposite the sensor and the other roller positioned opposite a fixed position roller. Means are provided for urging the pivoted rollers against the web surfaces whereby a change in web thickness will automatically calibrate the sensor to roller gap by self-adjustment of the pivoted rollers. The detector is particularly useful in combination with a seam jumper in a cloth shearing machine.

3,748,415

ACCELERATION RESPONSIVE SWITCH WITH MAGNETIC ACTUATOR MEANS

Masaru Suzuki, Hekikai, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Japan

Filed Nov. 26, 1971, Ser. No. 202,310
Claims priority, application Japan, Nov. 28, 1970, 45/118184 (utility model)
Int. Cl. H01h 35/14, 36/00
U.S. Cl. 200—61.45 M 5 Claims



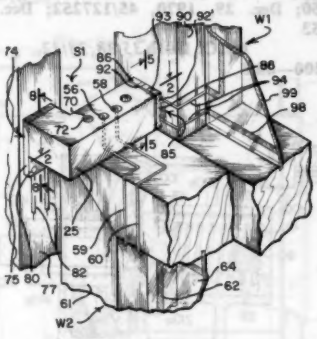
An acceleration responsive switching device which comprises a substantially generally cylindrical casing having formed a limited space over its upper peripheral surface and a substantially vertical bore with its one end open extending at a slight distance from a central portion of the limited space, acceleration sensing means accommodated in the limited space, a switch actuating means accommodated in the vertical bore and a switch element provided downwardly of the open end of the vertical bore. The acceleration sensing and switch actuating means are composed of a permanent magnet and a magnet substance, respectively, and vice versa. With this arrangement, the acceleration responsive switching device is actuated by an acceleration exceeding a predetermined level encountered in such moving vehicle as an automobile.

3,748,416

WINDOW SWITCH ASSEMBLIES FOR BURGLAR ALARM

Allen Wechter, 35-31 169th St., Flushing, N.Y.

Filed Mar. 9, 1972, Ser. No. 233,068
Int. Cl. G08b 13/08; H01h 3/16
U.S. Cl. 200—61.74 10 Claims



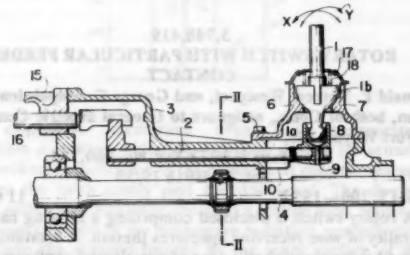
A switch assembly comprises an L-shaped insulative plastic casing mountable on the top of the frame of the lower window of double hung windows. First and second pairs of spring biased slidable contact elements are disposed respectively at opposite ends of the casing. Conductors in the casing connect the contact elements. On the casement enclosing the window is a first circuit member to which an external alarm circuit is connected. On the frame of the upper window is a second circuit element. Raising the lower window or lowering the upper window moves the contact elements with respect to the second circuit element to actuate the alarm circuit. Metallic loops can be provided on the windows connected respectively to the conductors and the first circuit member in a series circuit so that breaking either loop actuates the alarm circuit.

3,748,417

NEUTRAL POSITION DETECTOR SWITCH AND ACTUATING MEANS FOR VEHICLE TRANSMISSION

Hideki Morino, and Katsunori Watanabe, both of Aichi-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 17, 1972, Ser. No. 227,561
Claims priority, application Japan, Mar. 31, 1971, 46/23753
Int. Cl. H01h 3/16
U.S. Cl. 200—61.91 6 Claims



A neutral position detector for vehicle transmissions, wherein a detent is provided in a rod operably located between a manual shift lever and a shift operating mechanism of the transmission. A switch mechanism operated in response to the positioning of a ball displaceable into and out of the detent by movement of said rod generates a first signal when the transmission is in neutral and a second signal when the transmission is shifted out of neutral.

3,748,418

TANK-TYPE GAS-FILLED CIRCUIT BREAKER WITH IMPULSIVE SEAL BREAKING MEANS FOR INITIATING PISTON OPERATION

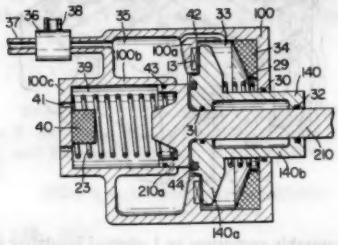
Kikuo Kawasaki, Kawasaki, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kanagawa-Ken, Japan

Filed Dec. 29, 1971, Ser. No. 213,455

Claims priority, application Japan, Dec. 29, 1970, 45/127250; Dec. 29, 1970, 45/127252; Dec. 29, 1970, 45/127253

Int. Cl. H01h *35/38, 33/32*

U.S. Cl. 200—82 B **5 Claims**



A tank type gas-filled circuit breaker has interrupting contacts contained in a pressurized insulating gas filled chamber provided within a tank which in itself forms a low-pressure gas chamber the circuit breaker includes, an operating rod of insulating material penetrating through the tank wall and the high pressure chamber and coupled to the interrupting contacts, a driving means for the operating rod including a piston operating in a cylinder disposed outside of the tank valve, means for sealing high-pressure gas, e.g., air, in a chamber formed at one side of the piston in the cylinder and means for creating an impulsive driving force for operating the valve means, whereby when the impulsive force acts to release the sealing of the valve means, the high-pressure gas is instantaneously introduced into the chamber at one side of the piston, and the insulating rod is operated by the piston to separate the contacts of the circuit breaker. The valve means per se may be operated by means using electromagnetic attractive or repulsion forces, or alternatively by an impulse caused by igniting an explosive agent.

3,748,419

ROTARY SWITCH WITH PARTICULAR FEEDER CONTACT

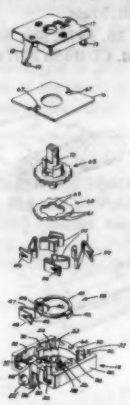
Donald F. Torrey, Westport, and George C. Mapelsden, Easton, both of Conn., assignors to General Electric Company, Fort Wayne, Ind.

Filed June 8, 1972, Ser. No. 260,744

Int. Cl. H01h *19/50*

U.S. Cl. 200—155 R **11 Claims**

A rotary switch is disclosed comprising a housing having a plurality of wire receiving apertures therein. A rotatable contactor having a peripheral edge of preselected configuration is mounted within the housing for rotation about an axis. A plurality of mutually spaced contacts is positioned within the housing radially about the axis for contact with portions of the contactor peripheral edge in rotatably selected contactor positions. A feeder contact is also positioned within the housing. The feeder contact has an annular portion positioned in pressure contact with the contactor in all rotatably selectable contactor positions, a pressure locking tongue portion overlaying at least a portion of one of the wire receiving apertures in the housing for locking engagement with a wire inserted through



the one wire receiving aperture, and a linking portion electrically and mechanically linking the annular portion with the pressure locking tongue portion.

3,748,420

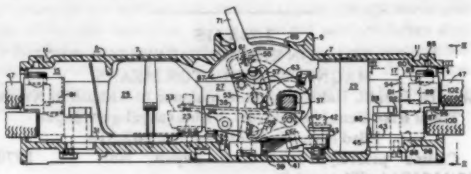
TERMINAL MEMBER FOR CIRCUIT INTERRUPTER

James O. Rexroad, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 18, 1972, Ser. No. 245,066

Int. Cl. H01r *7/12*

U.S. Cl. 200—168 R **9 Claims**



A terminal structure for a circuit interrupter with a stepped top surface and a stepped bottom surface by which the structure is divided generally into upper and lower portions. At least one horizontal opening extends through each upper and lower portion, one opening being above and another opening being below the stepped bottom surface. A substantially vertical threaded aperture extends from the top surface of each portion into each horizontal opening and a setscrew is disposed in each vertical aperture for securing electric cables in place.

3,748,421

MICROWAVE MELTER APPARATUS

Robert A. Peterson, Canton, Mass., assignor to Raytheon Company, Lexington, Mass.

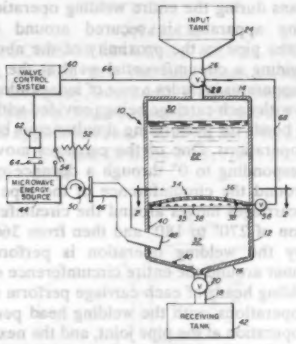
Filed July 29, 1971, Ser. No. 167,301

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **6 Claims**

Apparatus is disclosed for effecting a change in the state of materials from, for example, solid to fluid, or a viscous fluid to a freer-flowing fluid. A compartmentalized enclosure is provided with means for indirectly radiating electromagnetic microwave energy to heat, by absorption, the material to be treated. Continuous drainage of the resultant material is provided. The energy is radiated within an empty heating compartment which is dimensioned to define a cavity resonator

structure. The material is contained within a superimposed upper treatment compartment and comprises the load exposed to the microwave energy. A common separation wall of an energy permeable material provides for the admittance of the heating energy to successively erode the load as a fluid



medium which is removed by drainage means. Appropriate valve and sensing means in combination with the material treatment compartment are provided to prevent operation of the energy generator when no load is present. In treating viscous, gelatinous materials for film, the apparatus is appropriately rendered lightproof.

3,748,422

INDUCTION COIL FOR INDUCTION HEATING OF MOVING ARTICLES

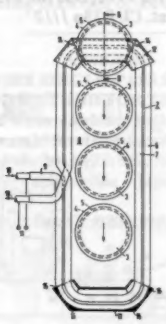
Hans Schafer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 30, 1972, Ser. No. 310,875

Claims priority, application Germany, Dec. 3, 1971, P 21 60 035.1

Int. Cl. H05b 5/06

U.S. Cl. 219—10.53 **10 Claims**



An induction coil for induction heating and joining of moving articles and materials, particularly for heat sealing nonmetallic containers with closures containing metal foil and thermoplastic material.

The induction coil consists of two or more turns of an electrically conducting tube which can be cooled by a coolant flowing through it. The coil is provided at two opposite end sections with means for attenuating the alternating magnetic field in the vicinity of these sections, which is normally generated by the flow of alternating current. At each of the two end sections at least one turn of the coil is enclosed by a sleeve of metal of such wall thickness that the sleeve is substantially impervious to the alternating magnetic field of the enclosed turn, and each sleeve is connected with a single turn of the coil in an electrically and thermally conducting manner.

3,748,423

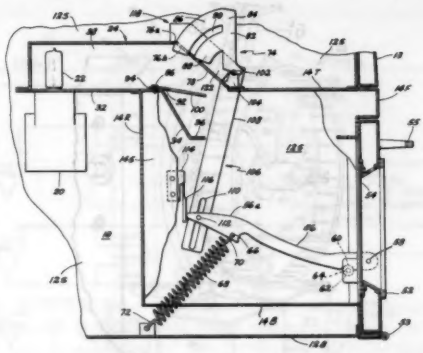
MICROWAVE OVEN INTERPOSE SYSTEM FOR CONTROL OF ENVIRONMENTAL RADIATION

Duane B. Haagensen, Edina, Minn., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1971, Ser. No. 124,842

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55 **25 Claims**



A deflector device is mechanically connected to the access door of a microwave oven. When the door is opened a deflecting plate, which is a part of the device, is automatically shifted into the waveguide to divert power from the main transmission path leading to the heating cavity to an alternate path having a termination medium associated therewith which absorbs the diverted power. The deflecting plate is retracted or withdrawn when the oven door is closed so that there can then be a resumption of normal power flow to the cavity.

3,748,424

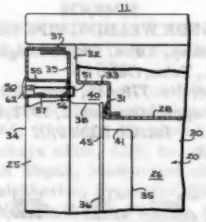
BUILT-IN LEAKAGE RADIATION DETECTING DEVICE FOR A MICROWAVE OVEN

Louis H. Fitzmayer, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 7, 1972, Ser. No. 278,596

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55 **5 Claims**

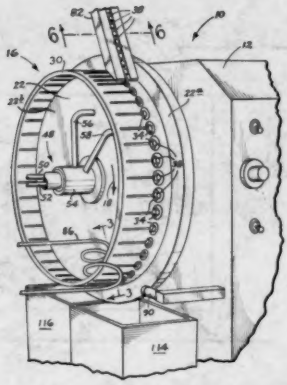


An electronic microwave oven has incorporated therewithin a leakage radiation detecting device for sensing and providing an indication of the presence of radiation escaping from the oven cavity past the door seal. The device, located within the oven door, includes a pickup loop, sensitive to the magnetic field of the microwave radiation, partially projecting into the channel formed by the inner surface of the door and the door frame external to the seal gasket. A transmission line, located coaxially within a cylindrical waveguide communicating with the leakage radiation, is resonant to a quarter wavelength of the operating microwave frequency and operatively couples the pickup loop with a neon lamp. When radiation above a predetermined level escapes from the oven cavity, a voltage is induced within the pickup loop which, by virtue of the resonance effect of the transmission line, is sufficient to light the neon lamp.

3,748,425
HEAT TREATING APPARATUS

Harold F. Potter, Aurora, Oreg., assignor to Carlton Company, Portland, Oreg.

Filed Nov. 1, 1971, Ser. No. 194,657
Int. Cl. H05b 5/02
U.S. Cl. 219—10.69 10 Claims

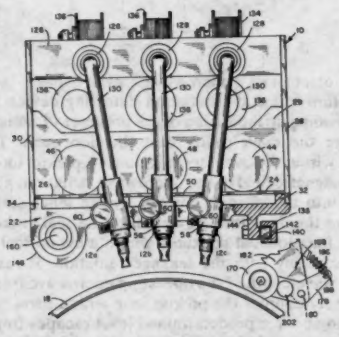


Apparatus for heat-treating articles including a rotatable ring having a plurality of article-receiving pockets disposed about its periphery and an inductive heating coil adjacent the ring. As the ring is rotated articles in the pockets are carried in succession past the coil and are heated. The apparatus also includes means for ejecting an article from the ring including an air supply, a conduit through which air under pressure from the supply may be directed against an article to dislodge it from the ring, and a normally-closed valve in the conduit inhibiting air flow through the conduit. A photocell adjacent the coil is responsive to changes in radiation emitted by each article as it is heated. The photocell is operable to detect when an article carried by the ring has been heated to a preselected temperature and when it detects such is operable to open the valve of the ejecting means to eject the heated article from the ring.

3,748,426
MEANS FOR WELDING PIPE SECTIONS

Richard Carl Stanley, Tulsa, Okla., assignor to Midwestern Specialties, Ltd., Tulsa, Okla.

Division of Ser. No. 778,416, Nov. 25, 1968, Pat. No. 3,681,560. This application Aug. 2, 1971, Ser. No. 168,078
Int. Cl. B23k 9/02
U.S. Cl. 219—60 A 8 Claims

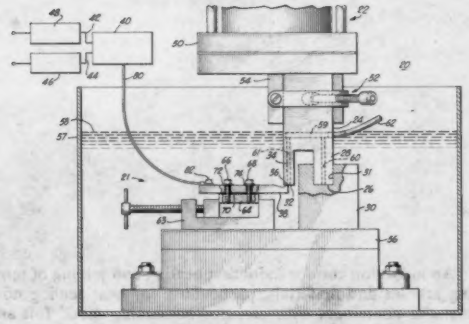


A method and means of welding adjacent pipe sections in tandem relation at the installation site for the pipe line. An internal clamping apparatus simultaneously engages the inner periphery of adjacent pipe ends in such a manner as to apply radially outward pressure thereto for reforming the ends into substantially identical circular configurations, regardless of any existing deformation in the pipe. The two reformed pipe ends are securely retained in an abutting position by the clamping means during the entire welding operation. An external welding apparatus is secured around the outer periphery of the pipe in the proximity of the abutting pipe ends for providing a circumferential weld at the pipe joint. The welding apparatus includes a pair of independently movable carriages, with each carriage being provided with a plurality of welding heads for performing simultaneous but sequential welding operations. One of the carriages moves from a position corresponding to 0° through a distance of substantially 180° around the circumference of the pipe while the other of the carriages moves around the circumference first from a position of 270° to 180° and then from 360° back to 270° whereby the welding operation is performed in a balanced manner around the entire circumference of the pipe joint. The welding heads of each carriage perform simultaneous welding operations, with the welding head performing a first welding operation at the pipe joint, and the next succeeding welding head tracking the movement of the first welding head and performing a second welding operation at substantially the exact optimum time interval between the two welding steps to assure an efficient welding of the joint. It is preferable to provide three of the welding heads on each carriage. However, it has also been found that two welding heads on each carriage perform an efficient total welding operation. Subsequent to the welding of the pipe joint, the internal clamping apparatus and external welding apparatus may be moved longitudinally along the pipe line to the position of the next pipe joint to be welded, and the entire operation may be repeated.

3,748,427
DEPTH STOP SENSING DEVICE FOR AN ELECTRICAL DISCHARGE MACHINE

Richard N. Baldwin, Bartlett, Ill., assignor to A. & A. Engineering Co., Franklin Park, Ill.

Filed Aug. 16, 1971, Ser. No. 172,068
Int. Cl. B23p 1/12
U.S. Cl. 219—69 S 13 Claims



A depth stop sensing device used in an electrical discharge machine which cuts holes of a specified depth in a conductive workpiece by eroding the workpiece with a discharge cutting current includes a tool electrode having a cutting porjection that is lowered into cutting relationship with the workpiece by a ram assembly. As a cutting current is applied by the tool electrode to the workpiece, a hole is formed in the workpiece in the same shape as the cutting projection. When the hole is cut to the specified depth, a sensing projection on the tool electrode supplies a signaling current to a sensing finger

disposed adjacent to the workpiece and positioned at the specified depth. A triggering circuit coupled to the sensing finger receives the signaling current from the sensing finger and initiates the retraction of the ram assembly and thereby the tool electrode from the workpiece so that the hole is not cut beyond the specified depth.

3,748,428

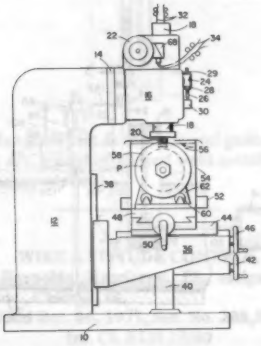
PROCESS OF MAKING A METAL SCREEN

George E. Nichols, Jr., Norfolk, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Division of Ser. No. 50,136, June 26, 1970, Pat. No. 3,664,502. This application Jan. 19, 1972, Ser. No. 218,951

Int. Cl. B23p 1/08, 1/04

U.S. Cl. 219—69 M **7 Claims**



A slotted screen for slurry is produced by Electrical Discharge Machining the slots in groups in a curved screen plate of metal at least one-eighth inch thick immersed in a dielectric liquid. The slots are formed by two sets of electrodes successively applied, the first set producing indentations extending partially through the plate, the second set forming narrower slots extending from the base of the indentations through the remaining thickness of metal.

3,748,429

MULTIPLE-WIRE SINGLE-PASS SUBMERGED-ARC WELDING METHOD FOR THICK PLATES

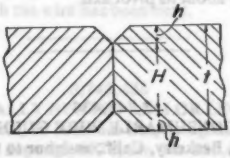
Kazuo Agusa, and Kozo Akahide, both of Chiba City, Japan, assignors to Kawasaki Steel Corporation, Kobe City, Japan

Filed Feb. 29, 1972, Ser. No. 230,270

Claims priority, application Japan, Mar. 15, 1971, 46/13948

Int. Cl. B23k 9/18

U.S. Cl. 219—73 **11 Claims**



A multiple-wire submerged-arc welding method for welding thick plates of thicker than 16 mm, by using a joint geometry, which consists of a root face width H of 15 to 25 mm and at least one V-groove with a groove depth *h* equivalent to 0.07H to 0.48H. The joint is welded from both-sides, one pass per side.

3,748,430

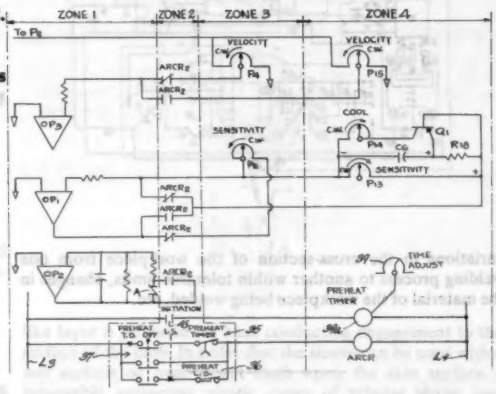
FLASH WELDING

James F. Deffenbaugh, Warren, Ohio, assignor to Wean Industries, Inc., Youngstown, Ohio

Filed Aug. 16, 1971, Ser. No. 172,161

Int. Cl. B23k 11/04

U.S. Cl. 219—97 **5 Claims**



The invention relates to means for modifying the control of a flash welder in order to provide an automatic pre-heat cycle prior to flash welding. The means may be selectively used at times when preheating of the workpieces is desirable or necessary. When used, it is automatically combined with the weld control at the initiation of the welder and is automatically removed from the combination at the end of a selectable preheat period.

3,748,431

APPARATUS FOR AUTOMATIC CONTROL OF A MACHINE FOR FLASH BUTT WELDING OF METAL PARTS

Sergei Nikolaevich Melbard, ulitsa Akademika Pavlova, 50, kv. 75; Anatoly Fedorovich Shakhnov, Kolomensky pereulok, 5, korpus 1, kv. 66; Alexandr Shmulevich Gelman, Tretya Tverskaya Yamskaya ulitsa, 42/8, kv. 46, all of Moscow; Ezra Shmulevich Slepak, Moskovskoi oblasti, ulitsa Turgeneva, 22, Malakhovka; Svyatoslav Nikolaevich Vivsik, Bolnichny pereulok, 3, kv. 56, Podolsk; Anatoly Ivanovich Bondarev, ulitsa Entuziastov, 3, kv. 38, Podosik; Leonid Pavlovich Desyatskov, Severny Tupik, 5, kv. 14, Podolsk, and Vladimir Sergeevich Morozov, Moskovskoi oblasti, Tsentralnaya ulitsa, 90, Bulatnikovo, all of U.S.S.R.

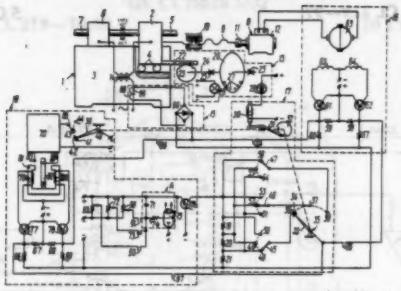
Filed June 4, 1971, Ser. No. 150,124

Int. Cl. B23k 9/10, 11/04

U.S. Cl. 219—97 **4 Claims**

An apparatus belonging to the class of adaptive automatic-control systems, comprising elements which allow welding to be conducted according to a preset program of the flashing current changing as a function of movement of the movable platen and to respond, with the help of feedback, to changes occurring in the welding process, for instance, changes in the torque of the drive of the movable platen, which influence changes in welding current, with a high degree of accuracy. A distinctive feature of the apparatus is the use of an adjusting regulator with a memory cell, which permits the preset pro-

gram to be automatically adjusted in the most advantageous manner in accordance with changing conditions, for instance,



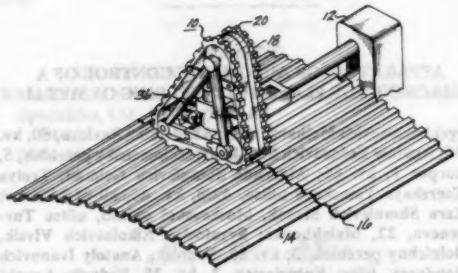
variations in the cross-section of the workpiece from one welding process to another within tolerable limits, changes in the material of the workpiece being welded, etc.

3,748,432

APPARATUS FOR WELDING CORRUGATED MATERIALS BY PLASMA ELECTRON BEAM WELDING SYSTEM

Thomas J. Bosworth, and Lowell L. Jackson, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1971, Ser. No. 212,296
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EB **12 Claims**



A method and apparatus for achieving electron beam or plasma electron beam welding of corrugated panels utilizing a particular vacuum chamber arrangement that encompasses only a small portion of the workpieces. This chamber is formed by the part being welded and a relatively soft rubber belt molded to fit the contour of the corrugations and formed of two interlocking havles. The interlocked lips of the belt and the configuration of the shell portion of the welding chamber is such that the belt seal opens and closes allowing passage of the welding head along its length while maintaining the vacuum seal.

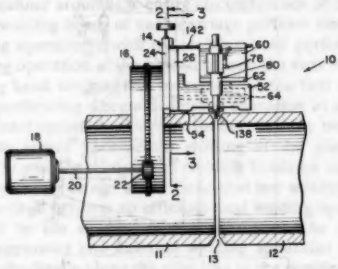
In one concept, the belt functions as a clamp-on chamber held on the parts by frictional force, while in a second concept, an endless seal belt integral with the welding unit is used to form a traveling chamber which "walks" along the panel surface.

3,748,433

ELECTRIC WELDING TORCH OSCILLATOR AND GUIDE

Richard B. Gwin, Arlington; William L. Ballis, Hilliard; Claude W. Churchheus, Laurelville, and Bruce L. Hutt, Valley View, all of Ohio, assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Filed Oct. 14, 1971, Ser. No. 189,175
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 R **23 Claims**



A welding head clamping and oscillating assembly is disclosed for use in a welding machine having means for supporting and moving the assembly along a joint to be welded. The assembly includes a support platform connected to the assembly supporting means of the welding machine and a support plate slidably mounted on the support platform for reciprocal movement in a direction transverse to the joint to be welded. A welding head clamp is pivotally mounted on the support plate for arcuate oscillating movement in a direction substantially parallel to the direction of the slidable mounting of the support plate and a reversible stepping motor is operatively connected to the clamp for oscillating the clamp about its pivot axis. An electrical control circuit is also provided for the stepping motor and includes logic circuitry for producing a pulse signal at a predetermined frequency and a binary counting circuit for counting a predetermined number of pulses from the signal and producing an output signal when the predetermined number of pulses is counted. The circuit includes means responsive to the output signal and operatively connected to the motor to drive the motor alternately in first and second directions in response to successive output signals from the binary counter thereby to oscillate the welding head clamp assembly about its pivot axis.

3,748,434

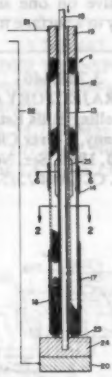
COMPOSITE CONSUMABLE WIRE GUIDE ELECTRODE

Dean C. Girard, Berkeley, Calif., assignor to Guide Tube Inc., Richmond and Jean LaForce, Inverness, both of Calif., part interest to each

Filed May 27, 1971, Ser. No. 147,896
Int. Cl. B23k *35/00*
U.S. Cl. 219—146 **13 Claims**

A consumable wire guide electrode for producing a high alloying effect on the weld deposit includes spaced inner and outer tubes defining a void therebetween filled with an alloying material and binder, the bore of the inner tube serving as a

guide for the feed of a continuous wire electrode therethrough. The outer tube is advantageously exteriorly



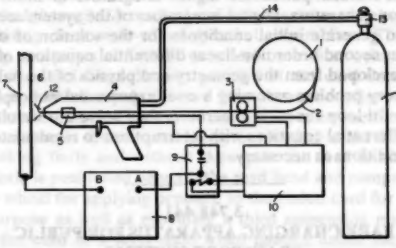
coated with flux such that as the wire and guide are consumed by an electric arc, a pool of alloyed weld metal with flux floating on the top is produced.

3,748,435

WIRE ATTITUDE CONTROL

Richard W. Reynolds, Hazelcrest, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Filed Dec. 16, 1971, Ser. No. 208,582
Int. Cl. B21f *23/00*
U.S. Cl. 219—130 **4 Claims**



A wire feed apparatus for use in conjunction with the gas metal arc welding process. The apparatus includes means for pulling the consummable electrode wire from a reel, a means for giving the wire a radius of curvature and means for controlling the attitude of the wire as it is fed to the work area. The attitude is adjusted by means of a skew adjustment on one of the drive wheels which causes the wire to be delivered at a controllable angle to either side of the plane passing through the arc over which the wire has been bent.

3,748,436

ELECTRICALLY HEATED ARM OR LEG SLEEVE

Leon H. Cossaboom, 20 Franmar Dr., Bridgeton, N.J.

Filed Sept. 24, 1971, Ser. No. 183,445
Int. Cl. H05b *1/00*
U.S. Cl. 219—211 **3 Claims**

There is shown by this disclosure an arm or leg sleeve that is electrically heated and which has an insulated external layer means and an internal non-insulated layer means for absorbing the heat and directing it to the surface of the arm or leg. The inner layer includes electric wiring arranged in sections with an upper section above the elbow or knee of the wearer and a lower section lying therebelow so that in working of the arm or leg, it will not be hindered by the wires and the wires will not be worked loose by the continuing flexing of the arm or leg when the sleeve is fixed thereover. A control box is provided on the sleeve which can govern the heat to either the upper or lower portions of the sleeve or can combine the upper and lower sections into the same circuit for joint heat or full heat along the full length of the limb. The sleeves are formed of layers including an insulated outer layer means and a heat conducting non-insulated inner layer means. The electric wires are embedded in the insulating material and a wool-

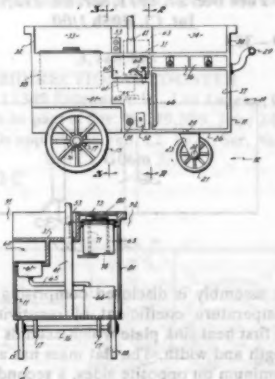
like layer is provided for heat conducting engagement to the surface of the limb. In order that the sleeve can be used with a wet surface or over a wet cloth upon the skin surface a removable protective plastic cover of tubular shape corresponding to the shape of the sleeve can be provided within the same to cover up the wool-like heat conducting material and to keep the same from becoming wet. Waterproof plastic cover is attached to the upper edge of the sleeve and retained thereby against inward displacement as the sleeve is pulled over the limb with the protective cover.

3,748,437

MOBILE FOOD CONCESSION CART

Ira A. Keeshin, and Ronald J. Kruse, both of Cincinnati, Ohio, assignors to Federated Department Stores, Inc., Cincinnati, Ohio

Filed July 27, 1971, Ser. No. 166,387
Int. Cl. H05b *1/00*; A47b *31/02*
U.S. Cl. 219—214 **1 Claim**



A mobile food cart for use in a portable food concession to function as a movable counter beside which a vendor may stand to sell food to customers. The cart is of the type which may be manually moved through doorways so that it may be used indoors and outdoors, and is provided with means to sup-

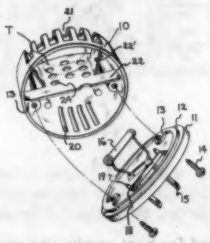
port and operate electrical food conditioning appliances to store and serve hot and cold food. A self-contained sink operates by gravity feed and includes a waste tank and a hot water reservoir having a thermostatically controlled immersion heater.

3,748,438

VAPORIZER DEVICE

Hal F. Costello, Toledo, Ohio, assignor to Coswell Products, Inc., Toledo, Ohio

Filed Jan. 14, 1972, Ser. No. 217,818
Int. Cl. A61l 3/00
U.S. Cl. 219—271 **3 Claims**



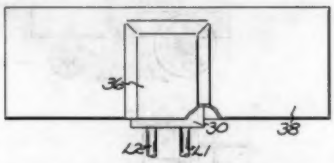
An electrically heated vaporizer having a pair of prongs to be plugged into a wall socket for vaporizing a chemically treated diffusable tablet for deodorizing, disinfecting, perfuming or otherwise treating air of a room, is formed of a hollow housing suitably foraminous to enable air to flow through so that air currents induced by the heater pass about the tablet to effect diffusion action. The housing is separated into two compartments by a partition on one side of which is the electrical heater, and the other side provides a shelf for the tablet. The partition panel has a sizeable number of small perforations for air passage, and oppositely arranged upwardly and outwardly inclined wings predetermine the position of the tablet and also baffle the air to the outlet passages.

3,748,439

HEATING APPARATUS

Youn H. Ting, Attleboro, and Leo Marcoux, Rehoboth, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1971, Ser. No. 212,158
Int. Cl. H05b 1/00
U.S. Cl. 219—353 **15 Claims**



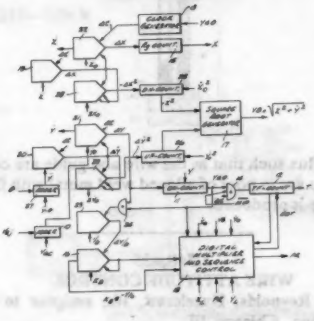
A heater assembly is disclosed comprising a flat mass of positive temperature coefficient of resistivity material attached to a first heat sink plate which extends beyond the flat mass in length and width. The flat mass has a flame sprayed layer of aluminum on opposite sides, a second flame sprayed layer of copper on at least one opposite side to permit attachment of a terminal, and the other opposite side being attached to the heat sink plate by electrically and thermally conductive solder or epoxy material. The flat mass and plate in one embodiment is received in a shrinkable electrically insulative sleeve and in another embodiment in a thermally conductive can, both the sleeve and can being sealed so that the assembly can be immersed in fluid for heating thereof. The heaters of both embodiments are received in a pocket formed in a second heat sink formed of elongated flexible foil having pressure sensitive adhesive on one surface to facilitate attachment of the assembly to a surface to be heated.

3,748,440

BALLISTIC TRAJECTORY COMPUTER

Thomas F. Alexander, Rolling Hills Estates, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 20, 1969, Ser. No. 886,600
Int. Cl. G06f 15/58
U.S. Cl. 235—61.5 R **13 Claims**



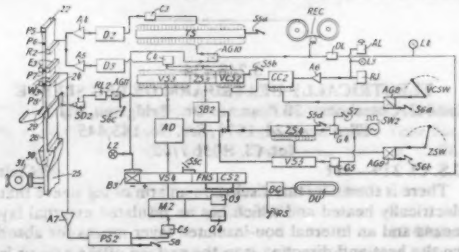
A real-time system is provided for calculating in less than about 40 msec. of actual time the ballistic time of fall and range of a weapon from a known altitude above a target using weighted clock pulses for digital integrators in multi-loop function generators. Digital integrators of the system are first used to generate initial conditions for the solution of simultaneous second order non-linear differential equations of motion developed from the geometry and physics of the ballistic trajectory problem assuming a cool exponential atmosphere. The multi-loop function generators then solve the simultaneous differential equations with interruptions to recalculate initial conditions as necessary.

3,748,441

FARE CHARGING APPARATUS FOR PUBLIC TRANSPORT SYSTEMS

John Wolfgang Halpern, 10 Gilroy House, Lancaster Gate, London, W.2., England

Continuation of Ser. No. 442,726, March 25, 1965, abandoned. This application June 16, 1970, Ser. No. 48,905
Claims priority, application Great Britain, Mar. 27, 1964, 8,147/64
Int. Cl. G06k 7/00
U.S. Cl. 235—61.6 R **9 Claims**



Fare charging apparatus for public conveyances using a fare card which has data recorded thereon which can be sensed by

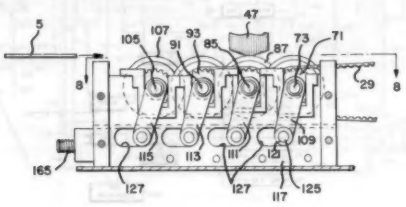
the apparatus electrically, stored, compared to point of departure apparatus, fare computation made, and the results thereof recorded on the card, which is then returned to the user.

3,748,442

CARD READER TRANSPORT DEVICE

Charles Michael Lovendusky, Enola, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 34,782, May 5, 1970. This application Feb. 11, 1972, Ser. No. 225,630
Int. Cl. G06k *13/05*
U.S. Cl. 235—61.11 D 9 Claims



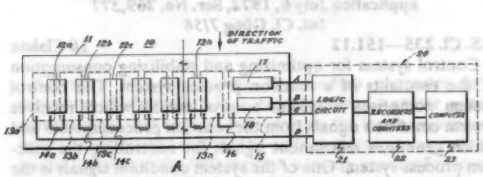
The disclosure relates to a transport mechanism for use with code cards such as credit cards and particularly for use with magnetically coded credit cards wherein a card is accepted into the device only in properly polarized manner due to embossing on the card or the like, entry of the card into the mechanism operating a switch which actuates circuitry capable of either admitting the card directly or waiting for an admit signal to drive the card into the card reader and past a read head whereupon the coded card is read. The coded card is propelled through the reader by means of a drive wheel system comprising four axle-wheel-sprocket assemblies. The assembly comprises a first drive wheel on a first axle which drives the card from the rest position at the card detection switch and which expels the card from the reader after a reading has taken place. The second and fourth axles each include a pair of wheels thereon and are spring loaded to aid the card in tracking flatly and without skew past the read head. The third axle is positioned beneath the read head and comprises a single wheel for applying pressure to the coded card for reading purpose as well as providing a third suspension point to keep the card in a level state when passing under the read head. The coded card is thereby supported at at least three points and a maximum of five points whereby even badly warped cards can be properly processed and accurately read.

3,748,443

WHEEL SENSING APPARATUS

Stanley Kroll, and Michael M. Platzman, both of 541 Green Pl., Woodmere, N.Y.

Filed July 1, 1971, Ser. No. 158,843
Int. Cl. G08g *1/065*
U.S. Cl. 235—92 TC 20 Claims



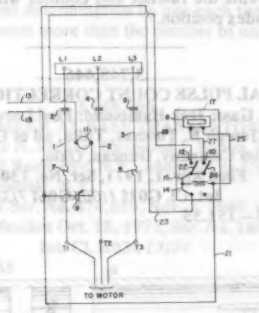
A treadle consisting of a set of upper contacts electrically separated from a set of lower contacts and placed in staggered arrangement with the lower set. The lower set has a fixed impedance between each contact. As a wheel crosses the treadle, the upper contacts beneath the wheel short out the lower contacts staggered thereunder, thereby reducing the total impedance. A control system detects the reduced impedance value and determines the wheel width. Pulse counting circuitry integral with the control system counts the wheel axles and determines the class of vehicle. Direction sensing and car counting may also be included with the treadle and control system. The weight class of the vehicles, as well as the approximate speed, can also be determined from the information detected.

3,748,444

ELECTRICAL IMPULSE COUNTER FOR AUTOMATIC CAR WASH AND THE LIKE

Joseph J. Gilboy; Robert C. Deane; Paul R. Kirtley, all of Richmond, and William C. Jenkins, Sandston, all of Va., assignors to Joseph J. Gilboy, Richmond, Va.

Filed Jan. 17, 1972, Ser. No. 218,285
Int. Cl. G06m *3/12*
U.S. Cl. 235—92 CT 7 Claims



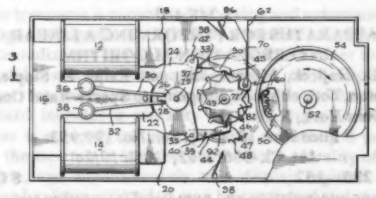
A counter system that insures a count each time power is applied to an electric motor or the like is disclosed. The system is particularly adaptable to automatic car wash apparatus but can also be incorporated into electrically controlled vending machines or the like. Electrical power cannot be applied to a motor or other electrically operative device until the electrical impulse counter has been energized. Thus, the process to be counted cannot begin until a count has been initiated. The counter and associated apparatus are housed in a tamper-proof box using armor type cable or the like.

3,748,445

BIDIRECTIONAL COUNTER

John S. Burton, 11349 Elderwood St., Los Angeles, Calif.

Continuation-in-part of Ser. No. 49,389, June 24, 1970, abandoned. This application Feb. 22, 1972, Ser. No. 227,972
Int. Cl. G06m *3/14*
U.S. Cl. 235—92 C 10 Claims



Herein described is a bidirectional add-subtract counter which includes a pivotal armature, and two coils associated with the armature to actuate the movement thereof. The

direction of pivotal movement of the armature is dependent upon the pulses applied to the coils. A pair of pawls actuated by the armature rotates a ratchet through a portion of the index whereby one pawl moves the ratchet in one direction and the other pawl moves the ratchet in a second direction. This is dependent upon the pivotal movement of the armature. Upon application of a pulse to a first coil, the armature rotates and cocks a first pawl which is pivotally connected to the armature, with such pawl being brought into operative contact with the ratchet, while the second pawl is moved out of operative contact with the ratchet. Upon termination of the pulse, the first pawl engages a tooth on the ratchet wheel and rotates the ratchet wheel in a first direction for a single increment. The energy for this motion is supplied by a spring return mechanism coacting with the armature to return the armature to its neutral position, and accordingly, causing arcuate movement in the pawls carried by the armature. A spring which has energy stored therein as the result of the original armature movement, forces the cam wheel to complete the ratchet rotation. A cam included in the pawl is adapted to engage a ratchet tooth to enable clearing of the second pawl from the ratchet teeth during the index motion. An anti-overthrow spring prevents the ratchet and counter wheel from rotating past their index position.

3,748,446

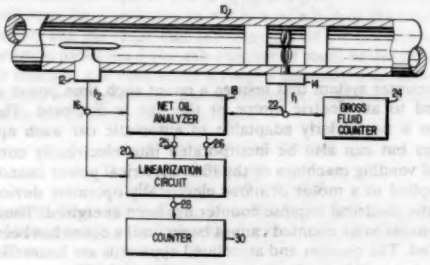
DIGITAL PULSE COUNT CORRECTION CIRCUIT

Edward W. Gass; Jack Hammond; Paul Lorenzino, all of Duncan, and Joseph E. Thomas, Tulsa, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 1, 1971, Ser. No. 130,375

Int. Cl. G01f 1/00; G06f 7/38

U.S. Cl. 235—151.35 **23 Claims**



Method and apparatus for linearizing an electrical signal comprising a series of electrical pulses non-linearly related in number to a sensed condition. The series of electrical pulses are counted in groups and a predetermined number of pulses are generated independently for each group of pulses counted. The method and apparatus has particular utility with a net oil analyzer where the condition is the oil/water ratio and where an initial offset is required at an oil/water ratio of one.

3,748,447

APPARATUS FOR PERFORMING A LINEAR INTERPOLATION ALGORITHM

James D. Hajicek, Minneapolis, and Ralph E. Sipple, New Brighton, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 199,953

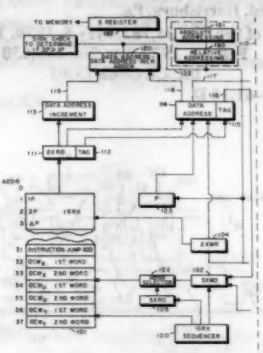
Int. Cl. G06f 1/02; G05b 19/24

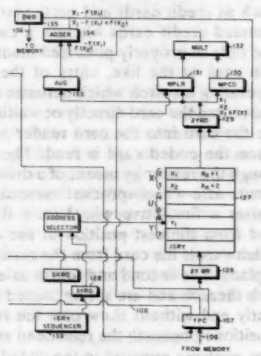
U.S. Cl. 235—152 **8 Claims**

A linear interpolation and numerical integration system employing U, X and Y arrays for computing additional sets of X and Y points in an X-Y coordinate system from a number of known sets of X and Y points. The U array is used to access 1P, ΔP and 2P values which constitute assigned points along the X axis and reference the known X points. Computation of the additional Y points is done in accordance with the expression:

$$Y_i = X_K \, z \, F(X_{K+1} - X_K)$$

where F is a fractional portion of the 1P value, which fractional portion is increased by ΔP each computation of Y_i. The necessary indexing and updating of the X and U array addresses and the P values is accomplished in an indexing section which operates time independently of the arithmetic means, thus permitting simultaneous computation and indexing functions in different Y_i determinations.





3,748,448

CONTROL SYSTEM FOR A REACTION PROCESS SYSTEM

John H. Sayles, Arlington Heights, and Allen L. Pekar, Brookfield, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

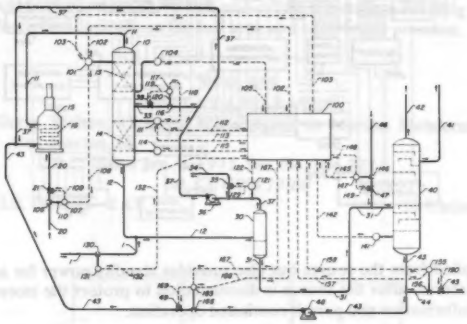
Continuation-in-part of Ser. No. 160,022, July 6, 1971. This application July 6, 1972, Ser. No. 269,377

Int. Cl. G06g 7/58

U.S. Cl. 235—151.12 **16 Claims**

Control system for optimizing and stabilizing consumption of the reactants of a reaction process system. The control system comprises a system control means which receives system condition signals from the reaction process system and which generates adjustment signals for controlling the reaction process system. One of the system condition signals is the amount of consumption of an uncontrollable reactant being supplied to the system. The system control means will generate a signal which is proportional to the uncontrollable reactant consumption signal received to control the severity of reaction within a reactor in the system. Another signal

received by the control system is an index indicative of conversion and material balance of the system. In a preferred embodiment this particular signal represents the level of the bottoms in a fractionator column. The control means has computer means for computing the change of this index with respect to time and for determining a parameter of comparison whose value is a function of the value of this index. Comparator means compares the actual rate of change of the index with the parameter of comparison and generates a signal for activating controller means in the reaction system. Comparator means is also provided to compare the index with limits of deviation and for generating signals for activating controller means in the reaction process system.

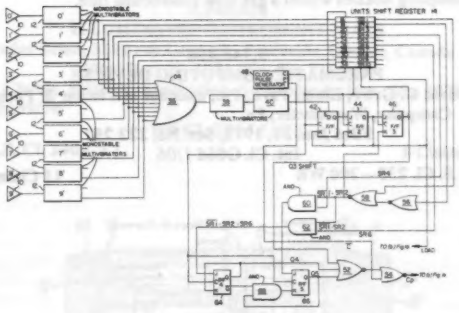


3,748,449

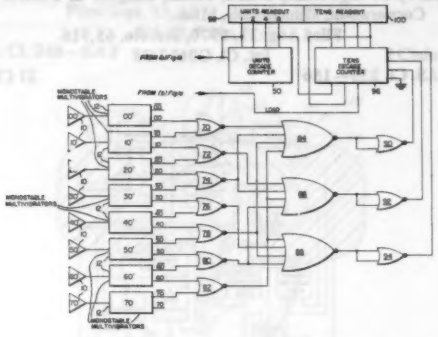
DEVICE FOR DETERMINING THE MEDIAN NUMBER IN A SERIES OF NUMBERS

Richard A. King, Singapore, Singapore, assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 2, 1971, Ser. No. 204,140
Int. Cl. G06f 7/48
U.S. Cl. 235—152 **3 Claims**



Circuitry for determining the median character in a sequence of characters in a predetermined number system comprising a shift register for receiving the input sequence of units characters and shifting the units characters to a predetermined location in the shift register, a binary counter for counting the number of shifts in the shift register plus counting the number of alternate characters in the sequence of characters to indicate the median units character in the sequence, and a logic circuit for receiving signals representing the "tens" characters in the sequence from which the median is to be determined. The logic circuit determining the "tens" character of the median number in the sequence by determining the lowest "tens" of character initially received and by increasing its output determination by one each time the binary units counter counts more than the number of units character of its radix.

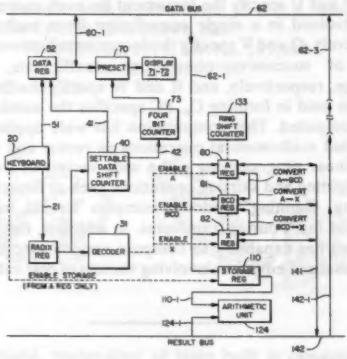


3,748,450

NUMERICAL BASE TRANSLATOR

Louis Fico; Roger N. Sheker; Raymond J. Ballou, and David C. Cosman, all of Rochester, N.Y., assignors to Comtec Industries, Inc., Rochester, N.Y.

Continuation of Ser. No. 874,859, Nov. 7, 1969, abandoned. This application Oct. 18, 1971, Ser. No. 189,964
Int. Cl. H03k 13/24
U.S. Cl. 235—155 **20 Claims**



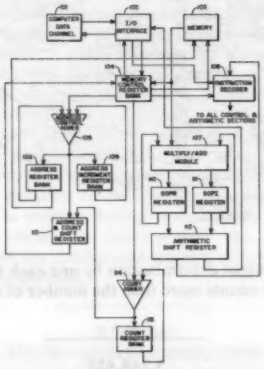
This translator is capable of receiving and automatically displaying most significant digit first, a number to any numerical base or radix; and it may then convert the number to another base and display the converted number, or it may store the number for use in an arithmetic operation. The translator keyboard includes a plurality of radix keys, and before a number is entered, its corresponding radix key is pushed to route the input data (number) to one of a plurality of holding registers, and simultaneously to a display register. When a number has been entered, it may be converted to another base and displayed, merely by pushing a different radix key. Alternatively the number can be stored by pushing a storage key, after which a second number is entered and an arithmetic unit may be operated to add, subtract, multiply or divide the two numbers.

3,748,451

GENERAL PURPOSE MATRIX PROCESSOR WITH CONVOLUTION CAPABILITIES

Larry D. Ingwersen, Blaine, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 21, 1970, Ser. No. 65,916
Int. Cl. G06f 7/38
U.S. Cl. 235—156 **21 Claims**



Method and apparatus of computing a generalized convolution of values from two matrices of complex values A_0 through A_m and B_0 through B_n respectively. The formula used in the computation of each complex vector element C_k of the generalized convolution is

$$\overline{C}_k = \sum_{j=0}^{LC-1} \overline{A}_{pj+Qk+R} \cdot \overline{B}_{Uj+Vk+W}, \; 0 \leq k < PC$$

where P and U specify the increment for each succeeding element involved in a single convolution from each sequence respectively, Q and V specify the increments between first elements of successive convolution coefficients, in each sequence, respectively, and R and W specify the first pair of elements used in forming C_k. PC specifies the number of C_k's to be computed. This computation has wide applicability to such allied mathematical operations as vector and matrix algebra, linear programming and a wide variety of transformation weighting and skirting operations such as Bessel function weighting, Hanning windows, complex Kernal transformations, and fast Fourier transforms. In addition, the apparatus described has capability to compute various special cases of the generalized equation involving vectors of real values only.

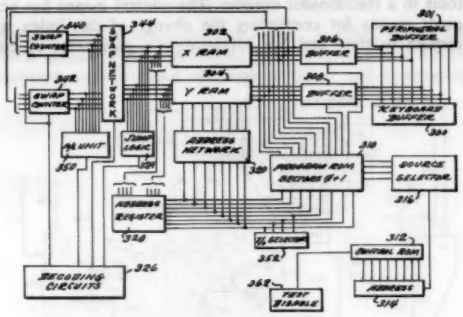
3,748,452

ELECTRONIC CASH REGISTER

Murray A. Ruben, Belmont, Mass., assignor to Alan M. Vorhee, Montgomery County, Md.

Filed Nov. 17, 1971, Ser. No. 199,685
Int. Cl. G06f 7/385, 7/50
U.S. Cl. 235—168 **8 Claims**

An electronic cash register whereby a manually operable keyboard produces signals indicating the keys operated which are received by an electronic microprocessor which in turn derives, stores and displays transaction data. The microprocessor includes a random access memory for storing variable transaction information, including totals, etc., and a read only memory for storing the instructions which derive the transaction information from the signals received from the keyboard. Any of a number of peripheral devices such as tape printers, displays, tape cassette recorders, inputs to computers, etc. can be coupled to the microprocessor to receive transaction information. The system is connected to a voltage source by circuitry which not only regulates the voltage ap-



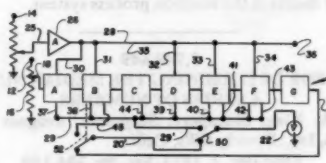
plied from the source but also provides standby power for an interval after the source is disconnected to protect the stored information and permit continued operation.

3,748,453

METER RATE COMPUTER

Richard E. McCorkle, 1306 Columbus St., Glendale, Calif.

Filed Feb. 24, 1972, Ser. No. 229,124
Int. Cl. G06g 7/16, 7/57
U.S. Cl. 235—194 **9 Claims**



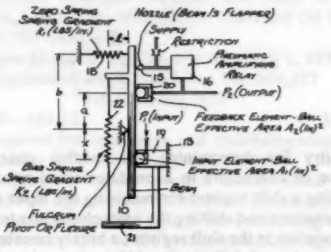
An electrical multiplier circuit for computing the necessary gas flow rate through the meter of a gas sampling apparatus which will provide isokinetic sampling at selected locations of sampling nozzles within a gas flow conducting flue.

3,748,454

PNEUMATIC COMPUTING DEVICES

David G. Grier, Elkins Park, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Jan. 31, 1972, Ser. No. 222,257
Int. Cl. G06d 1/06
U.S. Cl. 235—200 WB **11 Claims**



A pneumatic computing device operating on the force balance principle to provide a desired ratio between input and output values of pressure or pneumatically to carry out multiplying, dividing and other mathematical functions. The device includes a force beam supported on a fulcrum, the

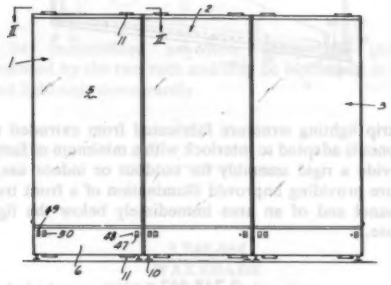
beam being caused to swing in one direction by an input force element whose position along the beam relative to the fulcrum is adjustable to vary the effect of input pressure on the beam. Beam deflection is sensed by a detector included in a feedback loop producing an output pressure that is applied to a feedback force element tending to swing the beam in the reverse direction, the feedback force being such as to maintain the beam in equilibrium. The input and feedback force elements are both constituted by ball-and-cylinder elements exerting a force that depends on the ball area and on cylinder pressure.

3,748,455

DISPLAY APPARATUS

Gerry Welton, Chicago, Ill., assignor to Morton Metalcraft Co., Morton, Ill.

Filed Jan. 6, 1971, Ser. No. 104,272
Int. Cl. G09f *13/00*
U.S. Cl. 240—2 AT **10 Claims**



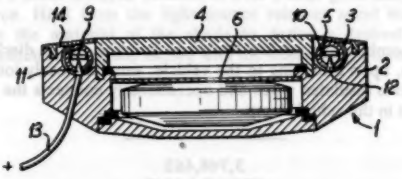
A portable display apparatus for exhibiting at a trade show or the like, and embodying a unit in the general form of a foldable light box easily set up without any tools and which may be transported easily from place to place in a station wagon or light truck, including an interchangeable translucent panel to carry transparencies or other visual exhibits. A plurality of units may be connected together for larger exhibits.

3,748,456

ILLUMINATED INSTRUMENT DIALS

Andre Brien, 3110 rue Germain, Fabreville, Quebec, Canada

Filed Dec. 27, 1971, Ser. No. 212,103
Claims priority, application Switzerland, Dec. 28, 1970, 19239/70
Int. Cl. G01d *11/28*
U.S. Cl. 240—2.1 **8 Claims**



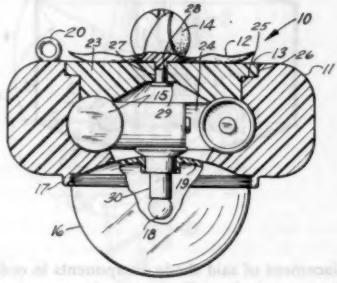
The dial of an instrument such as a watch is illuminated by an electric bulb housed in an elongated tubular element of supple transluscent plastic material removably fitted about the periphery of the dial in a groove in the instrument casing or bezel ring. Sharp terminals protruding in the groove cut through the tubular element to supply the bulb via contacts in the element.

3,748,457

FLOATING LIGHT FOR SWIMMING POOLS

Gloria J. Balitzky, 40567 Irval Dr., Sterling Heights, Mich., and Harold Sellers, 3103 N. Main St., Royal Oak, Mich.

Filed Sept. 13, 1971, Ser. No. 179,936
Int. Cl. F21u *21/00*
U.S. Cl. 240—6.4 F **2 Claims**



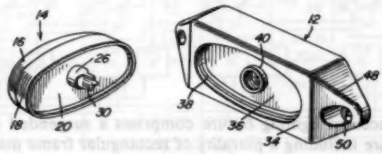
A battery operated safety light for a swimming pool. This device is a circular and floatable disc-like structure having on its interior a plurality of batteries which are enclosed in a water-tight compartment thereof. A bulb extends from a reflector at the lower portion of the device within a water-proof globe so as to illuminate the water within the pool at night.

3,748,458

DISPOSABLE WEDGE-TYPE BULB LAMP

Charles R. Morrison, Frewsburg; Howard A. Sage, and Edward R. Roberts, both of Jamestown, all of N.Y., assignors to Truck-Lite Co., Inc., Jamestown, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,907
Int. Cl. F21v *17/00*
U.S. Cl. 240—41.55 **9 Claims**



An unbased, wedge-type of lamp bulb is cemented to a reflector plate from which it projects in one direction into a sealed chamber formed in a lens cover to which the reflector plate is peripherally cemented. The base portion of the bulb projects into a socket of a holder within which the rim portion of the lens cover is releasably held.

3,748,459

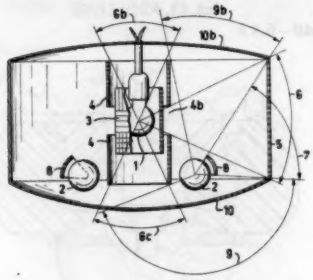
LAMP FOR DISPLAYING VARIABLE SHADING AND COLORING EFFECTS AND FOR GENERAL ILLUMINATION

Tarmo Aatos Nykanen, Turuntie 15, 32200 Loimaa, Finland

Filed Jan. 11, 1972, Ser. No. 216,967
Claims priority, application Finland, Jan. 12, 1971, 54
Int. Cl. F21v *11/18*
U.S. Cl. 240—46.19 **7 Claims**

A lamp comprising at least two light sources and shade components displaceable in relation to each other, whereby said

shade components are arranged to affect the light emitted by one light source upon an outer shade component due to mutual displacement of said shade components in order to vary the shading or coloring effects or both on outer shade element.



3,748,460

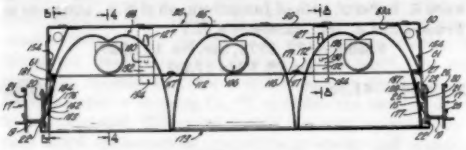
RECESSED SUSPENDED LIGHTING FIXTURE

Edison A. Price, 17 King St., New York, N.Y.

Continuation-in-part of Ser. No. 722,341, April 18, 1968, abandoned. This application Aug. 10, 1971, Ser. No. 170,667

Int. Cl. H05b *33/02*

U.S. Cl. 240—51.11 R 8 Claims



A recessed lighting fixture comprises a suspended ceiling structure including a plurality of rectangular frame members forming part of the ceiling support structure each frame member including a pair of opposite longitudinal tracks. A rectangular housing is provided with follower members defined by resilient metal bands depending from and engaging openings in the side walls of the housing and releasably slidably engaging the tracks to slidably support the housing which is longer than the frame member. A louver member registers with the frame and releasably engages the housing supporting followers. The housing is divided into a ballast compartment and a lamp compartment by a transverse lamp socket mounting panel and unitary spring elements releasably retain ballasts in the ballast compartment and releasably lock a ballast compartment closure panel in closed position. A reflector member is located in the housing and retained in position by lugs on the follower bands. The lighting fixture and support frame is characterized by the use of self-formed fastening arrangements and the obviation of welding, rivet screws and other similar fasteners. Access to the lamps, ballast compartment and the space above the ceiling is readily accessible as desired by dropping the louver member, sliding the housing and dropping an end of the housing.

3,748,461

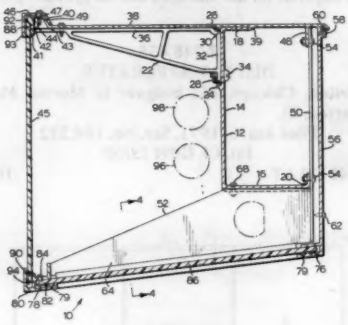
STRIP LIGHTING STRUCTURE

Arthur K. Wilson, and Oscar Bookbinder, both of Toronto, Ontario, Canada, assignors to said Wilson, by said Bookbinder, Toronto, Ontario, Canada

Filed Sept. 29, 1972, Ser. No. 293,432

Int. Cl. H05b *33/02*

U.S. Cl. 240—51.11 R 6 Claims



A strip lighting structure fabricated from extruded metal components adapted to interlock with a minimum of fasteners to provide a rigid assembly for outdoor or indoor use, said structure providing improved illumination of a front translucent panel and of an area immediately below the lighting structure.

3,748,462

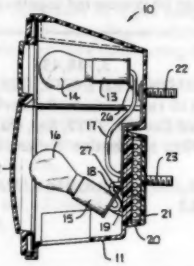
COMBINATION VEHICLE LAMP AND JUNCTION BOX

Charles J. Newman, Hanover, Ind., assignor to The Grote Manufacturing Company, Madison, Ind.

Filed Mar. 2, 1972, Ser. No. 231,282

Int. Cl. B60q *1/00*; F21v *21/08*

U.S. Cl. 240—57 7 Claims



A combination vehicle lamp and junction box is disclosed which, upon mounting to the vehicle, simultaneously joins at least two insulated wires and operationally connects the bulb socket in the vehicle lamp.

3,748,463

FLOOR LAMP

Duccio Trassinelli, Firenze, Italy, assignor to Sormani S.p.A., Arasio (Como), Italy

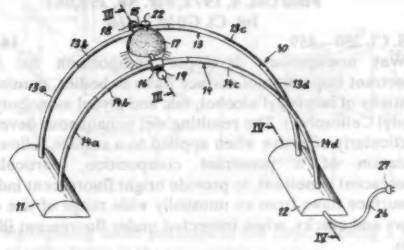
Filed Aug. 30, 1972, Ser. No. 284,906

Int. Cl. F21s *1/12*

U.S. Cl. 240—81 BS 9 Claims

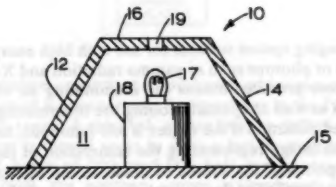
A glass globe is supported on a pair of metallic sleeves riding two arcuate, parallel metal rods which terminate at two bases, one of these bases containing a step-down transformer

by which the two rods may be energized with low-voltage current. A bulb inside the globe has terminals connected to the two sleeves so as to light upon closure of a switch; the globe



can be immobilized anywhere along the guidepath represented by the two rods and may be blackened at the top to emit light only downwardly.

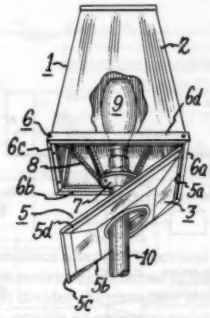
3,748,464
WAX SHADE
Frits J. Andeweg, 7737 Royal Ln., Dallas, Tex.
Filed Feb. 8, 1972, Ser. No. 224,462
Int. Cl. F21v *1/16*
U.S. Cl. 240—108 R **7 Claims**



A wax or wax appearing plastic shade or shell impregnated with a scent material positioned over a heat generating light source. Heat from the light source releases scent material from the material of the shade to derive a desired scent fragrance as the shade is used with the internal light turned on.

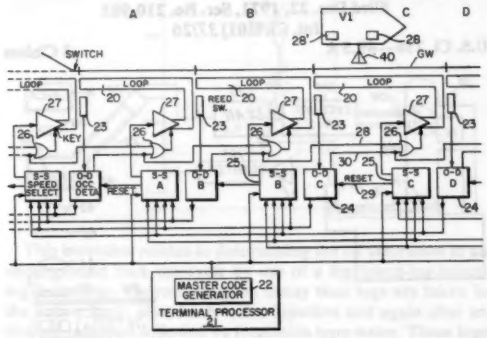
3,748,465
LUMINAIRE CLOSURE DEVICE
Omer E. Murray, and Robert G. Kilpatrick, both of Hendersonville, N.C., assignors to General Electric Company
Filed Apr. 24, 1972, Ser. No. 246,914
Int. Cl. F21v *21/00*
U.S. Cl. 240—147 **10 Claims**

Luminaire with housing of pyramidal shape open at its bottom has a light transmitting bottom door with a frame formed at one side with a hinge portion detachably fitting into the bottom frame of the housing. The hinge is detachable only when the door is swung open to a predetermined angle. Channels formed in the housing frame and in the door frame receive screws for holding the four sides of each frame in assembly. Recesses in the door frame side opposite the hinge side



receive a threaded portion of the captive locking screws in that side to enable the door to be opened when the captive screws are retracted. Other recesses in the door frame sides receive a ridge on the adjacent housing frame sides in the closed position of the door to prevent light leakage through the closure joint.

3,748,466
VEHICLE CONTROL SYSTEM
Henry C. Sibley, Adams Basin; John H. Auer, Jr., Fairport, and Willis R. Smith, Rochester, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.
Filed June 14, 1971, Ser. No. 152,845
Int. Cl. B61l *23/16*
U.S. Cl. 246—63 C **6 Claims**

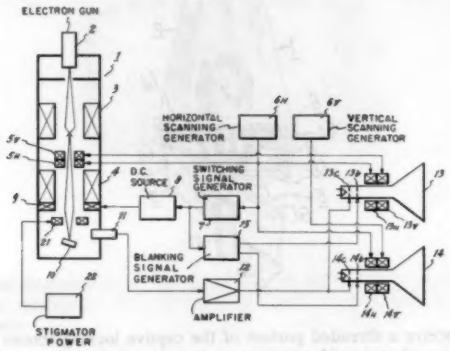


The vehicle control system operates vehicles over the right-of-way divided into a plurality of zones and has control means for governung safe operation of the vehicle in accordance with traffic conditions. The improvement comprises means of selecting both a desired speed limit and speed command control for communication to the vehicle occupying any of the zones in accordance with the conditions of traffic in advance of the zone, the selecting means is effective to select a relatively low command speed control zone in accordance with the selection of a relatively low speed control for at least one zone in advance of the vehicle in accordance with the safe stopping distance. Means communicates the selected limit and command speeds for each zone from the wayside to the vehicle occupying the zone and means controls operation of each vehicle in accordance with the selected speed limit and speed command controls communicated to the vehicle from the wayside.

3,748,467
SCANNING ELECTRON MICROSCOPE

Tadao Suganuma, Akishima-shi, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 7, 1971, Ser. No. 178,314
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 A 15 Claims

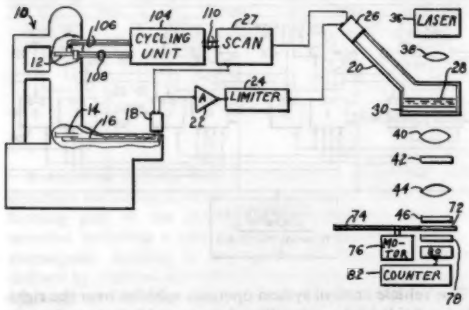


Disclosed is a scanning electron microscope which comprises the means for periodically changing the focal distance of the final condenser lens at two stages and the means for simultaneously displaying two scanning images corresponding to the two focal distances.

3,748,468
AUTOMATIC ELECTRON MICROSCOPE FIELD COUNTER

Arie W. Hartman, Gaithersburg, Md., assignor to General Electric Company, New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,982
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 A 2 Claims



Electron microscope stage is equipped with remotely controlled stepping devices; cycling signals cause presentation of successive fields, whose image is fed by fiber optics to a television image tube, such as an image orthicon, or an intensified vidicon. Image seen by orthicon is reproduced on oil-film light-valve. Coherent collimated light is fed through oil-film to a transform lens, located its own focal length from oil film; transform filter is transparent only to transform of particular shape to be identified, and is located at back focal plane of transform lens. Imaging lens is located with its front focal plane at filter; viewing screen at back focal plane of imaging lens shows field corresponding to microscope field, with light spots showing where objects matching filter in shape and size appear in field. Automatic spot counting plus automatic indexing of stage provide automatic field count.

3,748,469
NONAQUEOUS DEVELOPER COMPOSITION FOR PENETRANT INSPECTION AND METHOD FOR EMPLOYING SAME

Orlando G. Molina, Westminster, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

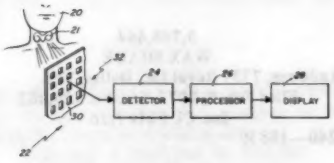
Filed Oct. 4, 1972, Ser. No. 295,061
Int. Cl. G01n 21/16
U.S. Cl. 250—459 16 Claims

Wet nonaqueous developer composition for use in penetrant inspection of surface flaws in bodies, consisting essentially of isopropyl alcohol, talc and glycol monobutyl ether (butyl Cellosolve). The resulting wet nonaqueous developer is particularly effective when applied to a surface following application of a penetrant composition, particularly a fluorescent penetrant, to provide bright fluorescent indication of surface flaws from an unusually wide range of size of such flaws and cracks, when inspected under fluorescent illumination.

3,748,470
IMAGING SYSTEM UTILIZING SPATIAL CODING

Harrison H. Barrett, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 2, 1970, Ser. No. 77,459
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 S 43 Claims



An imaging system suitable for use with high energy nuclear particles or photons such as gamma radiation and X-radiation. The system provides means for illuminating an object with radiation as well as spatially coding the illuminating radiation or emitted radiation if the object is self-luminous, to provide a composite image representing the summation of the shadows from all points of the source of illumination. Spatial modulation is accomplished by a mask having a coded pattern of transparent and opaque regions linearly scanned in time. The resulting signal has the characteristics of a chirp waveform typical of pulse compression radars. The composite image is readily decoded by a delay line having a phase or delay characteristic complementary to that of the spatial modulation pattern.

3,748,471
FALSE COLOR RADIANT ENERGY DETECTION METHOD AND APPARATUS

Donald S. Ross, Los Altos, and Lisle H. Roberts, Sunnyvale, both of Calif., assignors to International Imaging Systems, Mountain View, Calif.

Filed Sept. 24, 1971, Ser. No. 183,378
Int. Cl. G01j 3/00
U.S. Cl. 250—333 11 Claims

Visible and non-visible radiation reflected from an object is electronically detected and used to develop at least two

separate false colored images of the object which are then combined to produce, in real-time, a composite false colored

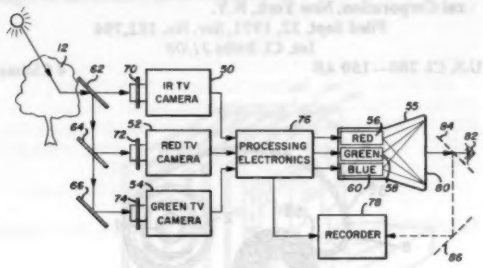


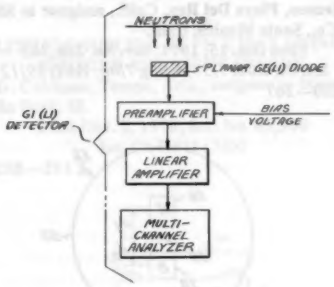
image highlighting those portions of the object having a high degree of reflectance in the non-visible spectrum.

3,748,472

METHOD OF MEASURING FAST-NEUTRON FLUX

Donald L. Smith, Bolingbrook, Ill., assignor to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Filed Aug. 11, 1972, Ser. No. 279,908
Int. Cl. G01t 3/00
U.S. Cl. 250—371 **6 Claims**



This invention consists of a novel method for measuring the neutron flux of monoenergetic fast-neutrons in the 700–5,000 keV energy range. A shielded, planar lithium-drifted germanium detector is placed so as to view a fast-neutron source. A collimated beam of 700 to 5,000 keV monoenergetic fast-neutrons from the neutron source is impinged upon the Ge(Li) diode of the detector. The number of internal conversion electrons with an energy of 691 keV produced within the Ge(Li) diode due to neutron inelastic scattering are counted and then converted according to a predetermined efficiency ratio for the detector into a value for neutron flux, the number of internal conversion electrons emitted being proportional to the total number of neutrons incident on the detector.

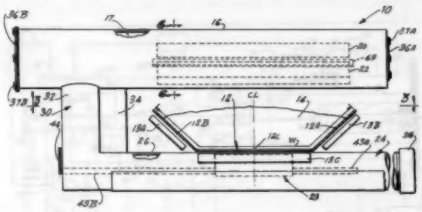
3,748,473

GAUGE FOR DETERMINING THE PERCENTAGE BY WEIGHT OF MOISTURE CONTAINED IN A BULK MATERIAL TRANSPORTED ON A MOVING CONVEYOR

You Min Chen, Cincinnati, Ohio, assignor to The Ohmart Corporation, Cincinnati, Ohio

Filed May 11, 1971, Ser. No. 142,127
Int. Cl. G01n 23/02, 23/12
U.S. Cl. 250—392 **18 Claims**

A moisture gauge including a radiation source for irradiating with fast neutrons and gamma radiation a bulk substance having moisture contained therein, a detector responsive to gamma radiation which has interacted with a predetermined fractional cross-sectional area of the bulk substance to produce a first electrical signal correlated to the total weight of the bulk substance including contained moisture, and a detector which is responsive to slow neutrons generated by the interaction of fast neutrons and hydrogen atoms of the contained moisture in said predetermined fractional cross-sectional area to produce a second electrical signal correlated to the weight of the moisture contained in the bulk substance. An electrical circuit divides the moisture weight signal and total weight signal to provide an output correlated to the percent by weight of moisture contained in the bulk material.

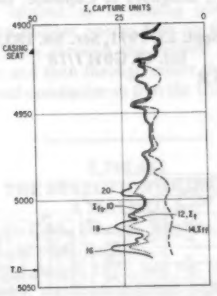


3,748,474

METHOD OF LOGGING A SUB-SURFACE FORMATION

Robert P. Murphy, Tulsa, Okla., assignor to Amoco Production Co., Tulsa, Okla.

Filed Dec. 27, 1971, Ser. No. 212,513
Int. Cl. G01t 1/18
U.S. Cl. 250—83.3 R **7 Claims**



This invention relates to determining the oil saturation in an underground rock reservoir by use of a log-inject-log-inject-log technique. Thermal neutron decay time logs are taken in the native state, after fresh water injection and again after an alcohol injection followed by formation type water. These logs are used in an equation to determine oil saturation without need of knowledge of porosity or thermal neutron capture cross section of the formation rock.

3,748,475

NEUTRON GENERATOR AXIALLY ASSISTED BY LASER

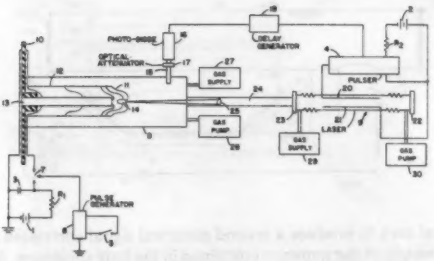
Romas A. Shatas, 8003 Navios Dr. SE; Harry C. Meyer, III, 10002 Conrad Dr. SE; John D. Stettler, 410 Cumberland Dr. SE, and Thomas G. Roberts, 2712 Mastin Lake Rd. NW, all of Huntsville, Ala.

Filed Feb. 17, 1972, Ser. No. 227,171
Int. Cl. G21g 3/00
U.S. Cl. 250—502 **3 Claims**

A high density pulsed plasma generator produces a high temperature plasma which is sensed by a photo switch which

in turn triggers the operation of a high energy pulse laser. The frequency of the laser light is such that the plasma will absorb it.

The laser is disposed in coaxial alignment with the center



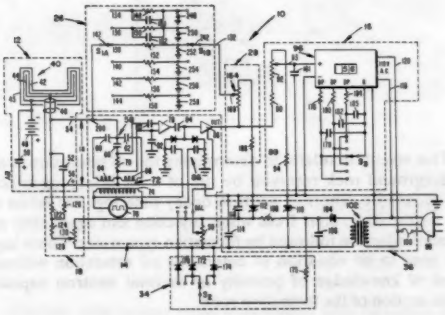
electrode of the plasma gun so that the high energy laser radiation illuminates the plasma blob axially to its motion with respect to the center electrode of the coaxial plasma gun.

3,748,476

RADIATION INDICATOR

Robert L. Lippman, Edgewater, N.J., and John C. Sunderland, New York, N.Y., assignors to Capintec, Inc., Mt. Vernon, N.Y.

Filed Sept. 23, 1971, Ser. No. 183,078
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R **10 Claims**



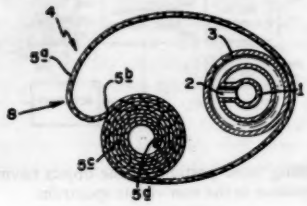
A radiation indicator for receiving extremely small currents, such as from an ionization chamber, and for converting same to a visual output indicative of the strength of a radioactive source under test. The radiation indicator includes a varactor bridge operational amplifier circuit, a circuit for eliminating the effects of background radiation, a calibration circuit for adjusting the gain of the radiation indicator in accordance with known radioisotope characteristics, a six-position range adjustment, and circuitry for optimizing the compromise between noise and response time.

3,748,477

CUSHION FOLD

Robert M. Wulbrecht, Utica, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,794
Int. Cl. B60n *21/08*
U.S. Cl. 280—150 AB **4 Claims**



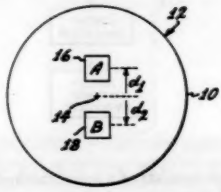
Folding of air cushion restraint means so that the cushion absorbs energy and is controlled in its deployment, the mass thereof first coming in contact with the occupant being minimized.

3,748,478

METHOD AND APPARATUS FOR DETECTING A FAINT ENERGY SOURCE

Paul K. Jensen, Playa Del Rey, Calif., assignor to SSR Instruments Co., Santa Monica, Calif.

Filed Dec. 15, 1971, Ser. No. 208,343
Int. Cl. G06f *7/38*; G06g *7/00*; H01j *39/12*
U.S. Cl. 250—207 **16 Claims**



A deflectable image dissector tube is utilized as a detector of a "faint" radiation source by alternately "viewing" the source and an adjacent nonradiating area. The deflection circuits are driven by a relatively high-frequency clock for a predetermined interval. Any detected photons are stored in a pair of counters, respectively corresponding to the area being scanned, and at the end of the interval, the difference between the stored counts represents the "brightness" of the source.

3,748,479

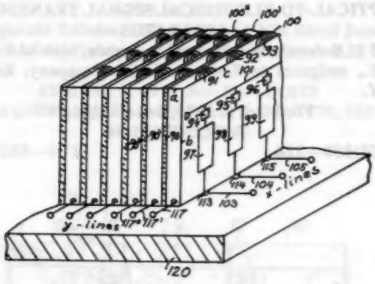
ARRAYS OF ELECTRO-OPTICAL ELEMENTS AND ASSOCIATED ELECTRIC CIRCUITRY

Kurt Lehovec, 11 Woodlawn Dr., Williamstown, Mass.

Division of Ser. No. 14,362, Feb. 26, 1970, Pat. No. 3,631,251.
This application Dec. 14, 1971, Ser. No. 207,886
Int. Cl. H01j *39/12*; H05b *37/00, 39/00*
U.S. Cl. 250—208 **5 Claims**

A solid material in shape of a parallelepipedon carries on one of its major surfaces a set of electric circuits, each connected to an electro-optical element for energy conversion between electric and radiative modes. The electro-optical elements are arranged in a row near a major edge of the parallelepipedon in such a manner that said radiative mode is

directed perpendicular to said edge thus defining a row of points for light emission, reception or modulation along said edge. A set of such parallelepipedons is stacked to provide a



two-dimensional array of such points for light emission, reception or modulation.

3,748,480

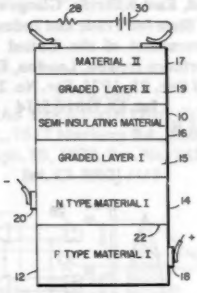
MONOLITHIC COUPLING DEVICE INCLUDING LIGHT EMITTER AND LIGHT SENSOR

Michael G. Coleman, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 2, 1970, Ser. No. 85,900

Int. Cl. H01l *15/00*

U.S. Cl. 250—211 J **6 Claims**



A solid state monolithic optical coupling device including a light emitting PN junction, a light sensor and an insulating body. The light emitting PN junction is formed by a body of P-type semiconductor and a body of N-type semiconductor. The insulating body is formed on the body of N-type semiconductor and the light sensor includes a body of photoconductive material formed on the insulating body. Electrical contacts are provided on the P-type and on the N-type semiconductor, respectively for biasing the light emitting PN junction, and spaced contacts are provided on the body of photoconductive material for applying a voltage thereto. When the light emitting junction is forward biased, light emitted thereat is transmitted through the insulating body and is absorbed by the photoconductive material, causing the conductivity thereof to change and thereby changing the current through the spaced electrodes thereon.

3,748,481

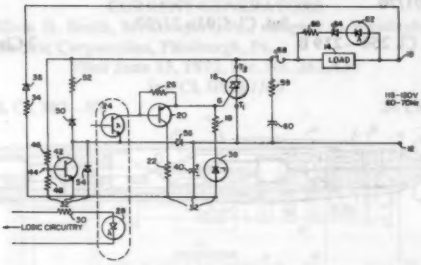
OPTICALLY COUPLED SOLID STATE RELAY

Paul W. Wagener, Depew, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1972, Ser. No. 251,307

Int. Cl. H01j *39/12*

U.S. Cl. 250—214 R **5 Claims**



An optically coupled A.C. solid state relay is disclosed. A triac is serially connected with a load to be energized, the series combination being connected in parallel with an A.C. voltage source. A phototransistor is positioned to receive a signal of radiant energy when the load is to be energized. A first transistor is connected in a current path with the phototransistor, and with its common terminal clamped at a fixed potential. A second transistor is interposed between, and coupled to, the gate of the triac and to the phototransistor. A unidirectional conductor is connected to one main terminal of the triac and is coupled to the phototransistor and th first transistor. A voltage divider is connected to the fixed potential and to the other main terminal of the triac, the divided voltage portion being applied as a biasing potential to te first transistor. When radiant energy falls on the phototransistor, gating current flow through the second transistor and the phototransistor and then through either the first transistor or the unidirectional conductor so that the triac conducts in both directions.

3,748,482

DEVICE FOR THE DETECTION OF IRREGULARITIES IN A MATERIAL

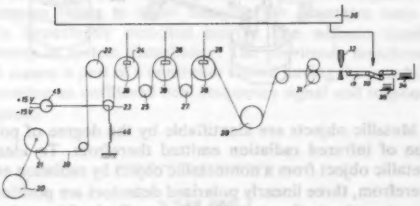
Etienne Marie De Cock, Hamme, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed June 7, 1971, Ser. No. 150,646

Claims priority, application Great Britain, June 8, 1970, 27,617/70

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 DF **9 Claims**

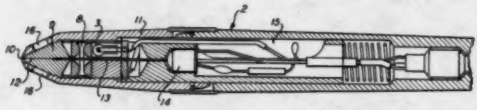


An apparatus for the detection of irregularities in a moving sheet material. The apparatus comprises a roller for guiding the sheet material along a non-rectilinear path. The roller has sections of reduced diameter so that the sheet is self-supporting at the corresponding areas, and the detection of irregularities in the sheet occurs in said unsupported areas.

3,748,483
INDICATING DEVICE FOR USE IN OPTICAL DATA SENSING EQUIPMENT

Gosta R. Englund, Stockholm, and Rune L. Myren, Spanga, both of Sweden, assignors to Svenska Dataregister AB, Solna, Sweden

Filed Dec. 14, 1971, Ser. No. 207,885
Claims priority, application Sweden, Dec. 17, 1970, 17101/70
Int. Cl. G01n 21/30
U.S. Cl. 250—219 D 2 Claims

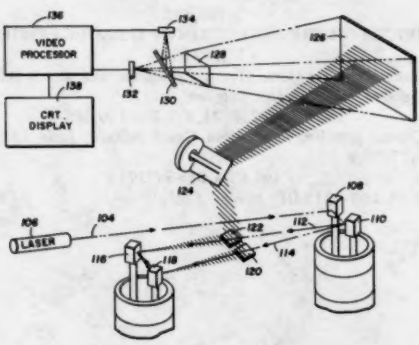


Within the housing of a handheld optical reader lamps are arranged for producing a light spot on a document bearing readable information indicia. The light produced by the lamps is fed to a light spot opening in the housing of the reader. An indicating means in the housing is provided by apertures which serve to transmit a small part of the light produced by the lamps. Via a control device the light is switched off each time a specific indicia is found on the document. The light is not switched on until a data processing unit, e.g. a cash register, is ready for receiving new data.

3,748,484
OBJECT IDENTIFICATION BY EMISSION POLARIZATION

Dennis O. Covault, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 889,406, Dec. 31, 1969, Pat. No. 3,631,254. This application June 7, 1971, Ser. No. 150,739
Int. Cl. G02t 1/18
U.S. Cl. 250—225 10 Claims

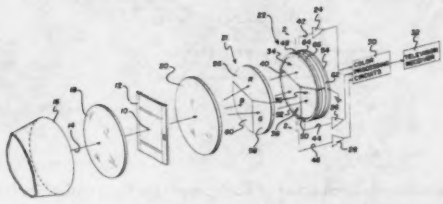


Metallic objects are identifiable by the degree of polarization of infrared radiation emitted therefrom. To identify a metallic object from a nonmetallic object by radiation emitted therefrom, three linearly polarized detectors are positioned to be responsive to the emitted radiation. Each of these three detectors is responsive to radiation from the object along a different plane of polarization. Output signals from the three detectors are processed in a system to produce a signal equal to the square of the degree of polarization. Smooth objects are distinguishable from rough objects in the same field of view by determining the degree of polarization of a light beam directed to and reflected from the objects. By knowing the polarization axis of the light waves at the source, the output signals of two detectors may be combined to highlight in a display smooth objects in a field of view that contains both smooth and rough objects.

3,748,485
OPTICAL-TO-ELECTRICAL SIGNAL TRANSDUCER APPARATUS

David L. Babcock, and Richard J. Sypula, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1971, Ser. No. 186,747
Int. Cl. G01j 3/34
U.S. Cl. 250—226 7 Claims

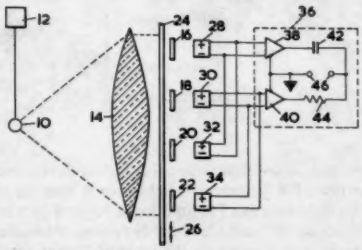


A photosensitive semiconductor array includes a plurality of photodiodes with separate output electrodes and color filters overlaying each photodiode. Each of the photodiodes, when simultaneously exposed to a point source of image bearing multicolored light focused on the photodiode array, responds by producing signals at its output terminals. The size of each photodiode and the filters overlaying same may be altered to change the response thereof. The photodiode array is useful in translating a light beam scanning motion picture film frames into red, green and blue color signals.

3,748,486
POSITION DETECTION AND CONTROL DEVICES

Alexander Russell, East Kilbride, Glasgow, Scotland, assignor to Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 21, 1971, Ser. No. 210,332
Int. Cl. G01d 5/34
U.S. Cl. 250—231 R 11 Claims



Apparatus for monitoring relative movement of a member, which includes an extended diffraction grating, a plurality of cooperating index gratings, at least one source of cyclically modulated radiation and photo-electric transducer means arranged so that the extended grating is mounted on the movable machine part and cyclically modulated radiation passes through the extended grating and the fixed index gratings to the photo-electric transducer means so as to produce therefrom, through the moire fringe effect, a cyclic electrical

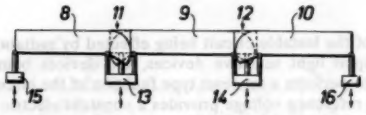
signal which is constant in phase while the member is stationary and varies in phase in accordance with movement of the member.

3,748,487

RADIATION ABSORBING DEVICE FOR RADIOGRAPHIC APPARATUSES

Paul Ragnvald Edholm, Linkoping, and Nils Bertil Jacobson, Solna, both of Sweden, assignors to Medinova AB, Solna, Sweden

Filed Feb. 5, 1971, Ser. No. 113,013
Claims priority, application Sweden, Feb. 9, 1970, 1651/70
Int. Cl. H05g 3/00
U.S. Cl. 250—65 R **11 Claims**



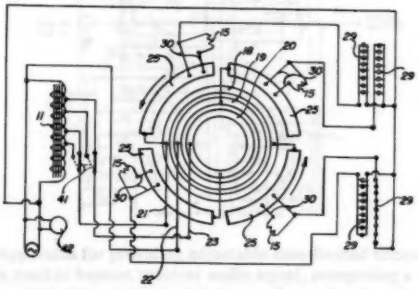
The invention concerns a radiation absorbing device adapted to be used as a compensating filter device in radiographic apparatuses for reducing the variations in average exposure in different portions of the radiograph, whereby a substantially uniform image contrast all over the radiograph is produced. The radiation absorbing device consists of two or several bodies of a radiation absorbing material, which are coupled to each other through flexible joints so that the shape of the radiation abosrbing device can be varied and adapted to the size, shape and contour of the object being radiographed. The flexible joints between the absorption bodies are of a special design so as to produce no sharp discontinuities in the radiation absorption of the device, which might create false shadow images on the radiograph.

3,748,488

CHRISTMAS TREE LIGHTING CONTROL

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md.

Filed Apr. 10, 1972, Ser. No. 242,627
Int. Cl. H02j 1/10
U.S. Cl. 307—18 **5 Claims**



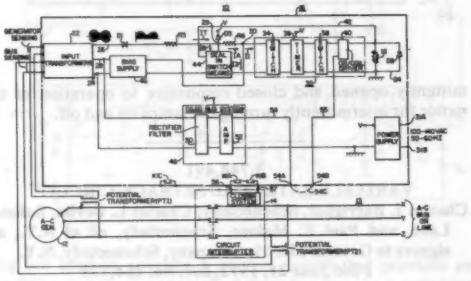
A control for Christmas tree lighting wherein a plurality of voltages are applied individually and in a predetermined sequential order to all the light strings of a tree to produce a twinkling and shimmering effect heretofore unobtainable by any form or combination of conventional flasher apparatus.

3,748,489

STATIC SYNCHRONIZER FOR ALTERNATING CURRENT GENERATORS

William H. South, McKeesport, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1972, Ser. No. 262,435
Int. Cl. H02j 1/00
U.S. Cl. 307—87 **24 Claims**



A synchronizer for matching the voltage and frequency of a relatively lower rating alternating current generator to those of an alternating current bus or line to which the generator is to be connected. A circuit breaker is interposed between the generator and bus to complete the circuit between them upon command from the synchronizer. The voltage and frequency on both sides of the circuit breaker are sensed and supplied to the synchronizer circuit in signal form. The voltages and frequencies are then beat together and supplied to a switch means. If both of the composite voltage and frequency values are within acceptable limits for connecting the AC generator to the bus or line, sufficient electrical current is supplied to the switch means to overcome the bias supply and trigger the switch means to cause closing of the circuit breaker. A dead bus system is included which allows the closing of the circuit breaker if the bus is either dead or at a voltage significantly below the voltage of the alternating current generator when the generator is to be connected to the line. A seal-in circuit is also provided so that once the switch means has been actuated to close the circuit breaker, the circuit closing cycle will be completed even though the frequency and voltage of the previously mentioned alternating current generator and line begin to vary with respect to each other slightly. This is possible, if the alternating current generator is sufficiently low in volt-ampere rating to allow bringing the generator onto a slightly imperfectly matched bus or line without significant bump or system disturbance. The previously mentioned switch means is part of a controller circuit having the capability of sensing an unfiltered beat frequency signal and responding thereto.

3,748,490

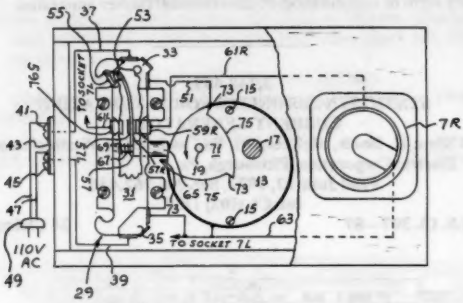
BURGLARY DETERRENT DEVICE

William C. Gruber, Mapaville, Mo.

Filed Sept. 22, 1971, Ser. No. 182,711
Int. Cl. H01h 7/00
U.S. Cl. 307—141 **12 Claims**

A device for deterring burglars comprises a base supporting incandescent lamp bulbs and containing an electric motor

with its shaft projecting upwardly from the base between the bulbs to support a rotatable partial shade, and a switch inter-



mittently opened and closed responsive to operation of the motor for intermittently turning the lamps on and off.

3,748,491

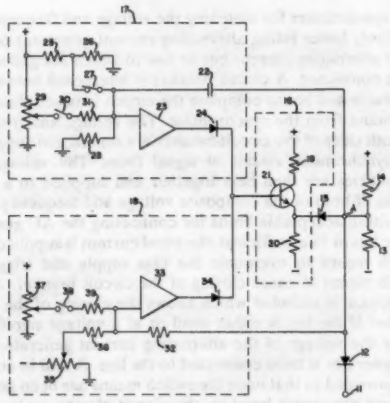
VARIABLE RATE LOAD SETBACK CIRCUIT

Charles J. Barrigher, Schenectady; Charles L. Devlin, Ballston Lake, and Paul E. Malone, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 21, 1972, Ser. No. 264,799

Int. Cl. F01d *17/08*

U.S. Cl. 307—149 **12 Claims**



A turbine control circuit which adjust the rate of power reduction by adjusting a load reference signal to control a steam control valve to compensate for the rate of loss of steam for the continued operation of a turbine with a failed component in the steam generating loop.

3,748,492

LIGHT-TRIGGERED ELECTRIC POWER SOURCE

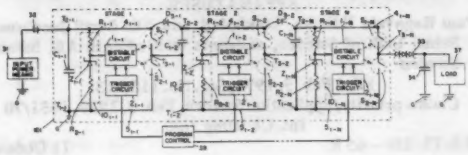
Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 25, 1972, Ser. No. 256,811

Int. Cl. H01h *35/00*

U.S. Cl. 307—117 **54 Claims**

An electric power source for delivering a controllable voltage to a load. It has low power loss and is capable of acting as a programmable source of electric energy, one which can be used, for example, to furnish a very high-voltage output from a light-weight system. The power source is a modular type structure in which the apparatus is made up of a number of identical stages or modules connected in cascade. Each stage includes a voltage supply and floating reference voltage means connected to the supply. The voltage supply is connected to the output of the source through bilateral, solid-state switches along alternate electrically conductive paths which connect either one side or the other of the voltage supply to the output. A bistable circuit serves to control the bilateral switches, triggering of the bistable circuit being effected by radiation impinged upon light sensitive devices, the devices being connected to perform a set-reset type function of the circuit. The floating reference voltage provides a constant electric potential for switching purposes. The system can be used to step up a voltage, and a form thereof can be used to step a voltage down.



3,748,493

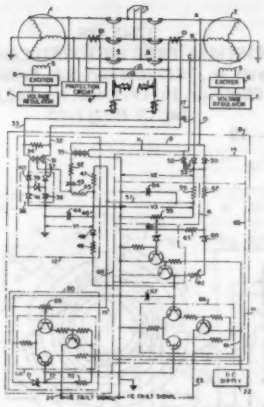
OVER AND UNDER EXCITATION PROTECTION CIRCUIT FOR ALTERNATING CURRENT POWER SYSTEMS INCLUDING IMPROVED DEMODULATOR CIRCUIT

William W. Billings, and Wendell Calfee, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 71,925, Sept. 14, 1970, Pat. No. 3,683,199. This application Dec. 14, 1971, Ser. No. 207,876

Int. Cl. H03k *5/20*

U.S. Cl. 307—232 **1 Claim**



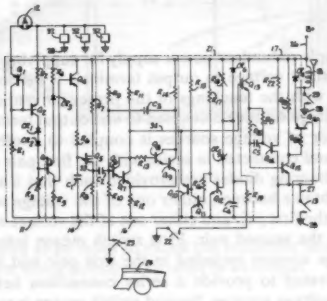
Polyphase generators operating in parallel are provided with a circuit to protect against over or under excitation of any one generator. The circuit comprises means for developing a direct voltage proportional to the differential reactive current of each generator and also means for developing a direct voltage proportional to the rectified phase voltages, such voltages being summed and the result compared with a reference.

3,748,494
VEHICLE ALARM SYSTEM

Philip L. Nine, Indianapolis, Ind., assignor to Curtis Dyna-Products Corporation, Westfield, Ind.

Division of Ser. No. 847,922, Aug. 6, 1969, Pat. No. 3,605,087.
This application Apr. 14, 1971, Ser. No. 134,033
Int. Cl. H03k 5/20; H02h 3/00
U.S. Cl. 307—235 5 Claims

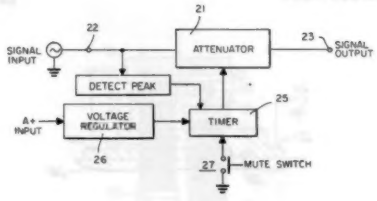
A sensitive current detector includes the vehicle ammeter and is responsive to current therein to activate a first pulser which sets a monostable multivibrator which activates another pulser having an output to the vehicle horn relay to sound the horn at a 2 cycle per second (Hz) frequency. The monostable multivibrator resets after 1 minute of sounding of the horn to deactivate the horn unless the current detector continues to sense current. A delay timer responds to a key operated switch or a remote disable switch to inhibit, for 15 seconds, activation of the second pulser by the monostable. The monostable multivibrator can also be set by mechanically operable switches.



3,748,495
BEACON MARKER INTERRUPT DEVICE

Norman A. Messinger, Center Square, Pa., assignor to Narco Scientific Industries, Inc., Ft. Washington, Pa.

Filed Dec. 6, 1971, Ser. No. 205,088
Int. Cl. H03k 5/08
U.S. Cl. 307—237 7 Claims



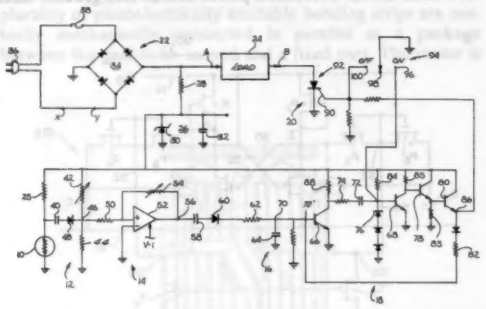
Apparatus for providing adjustable time-limited attenuation of a marker beacon receiver audio signal, comprising a variable attentuator connected between the audio signal source and the audio signal output, and shunted by a normally closed timer switch. An adjustable RC timing circuit, actuated by an automatic or manually operable mute switch, drives a two state amplifier, the output of which is connected to and operates the timer switch.

3,748,496
SOUND ACTIVATED CONTROLLER

Robert A. Hedin, 41272 Village Lake Rd., Novi, Mich., and Alfiero F. Balzano, 401 Emerald Way, Orange, Calif.

Filed Oct. 26, 1971, Ser. No. 192,205
Int. Cl. H03k 17/56
U.S. Cl. 307—252 W 8 Claims

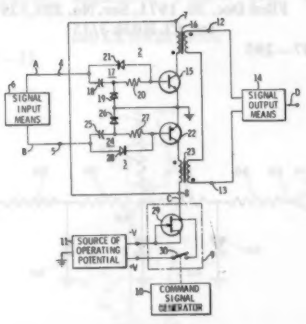
According to one preferred embodiment, a controller in accordance with the invention includes a microphone, threshold circuit and high gain amplifier arrangement for selectively converting sound energy into digital signals which after filtering are used to energize a control circuit that provides an enabling signal, of a controlled time duration, to a switching device.



3,748,497
TRANSFER GATE

David H. Woods, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 3, 1971, Ser. No. 177,565
Int. Cl. H03k 17/00
U.S. Cl. 307—255 5 Claims



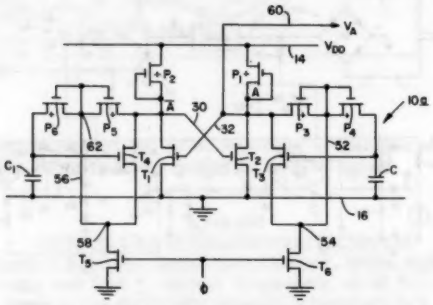
A pair of AND gates have opposite polarity signals applied to their respective signal inputs and the same polarity control pulse applied to their respective control inputs, at a given time. Control means are included for controlling the polarity of the control pulse which is supplied to the respective control inputs of the AND gates. In response to the control pulse being of one value, the first AND gate provides an output signal and the second AND gate provides no output signal. In response to the control pulse being a second value the first AND gate provides no output signal and the second AND gate provides an output signal.

3,748,498
LOW VOLTAGE QUASI STATIC FLIP-FLOP

Kurt Hoffmann, Sunnyvale, Calif., assignor to American Micro-Systems, Incorporated, Santa Clara, Calif.

Filed July 27, 1972, Ser. No. 275,540
Int. Cl. H03k 3/286, 3/33
U.S. Cl. 307—279 10 Claims

An integrated circuit providing a quasi static flip-flop function that is operable by a relatively low voltage source and requires only a single clock pulse. A pair of cross-connected latch transistors are each connected through a separate node to a load device between a power source and ground. Each

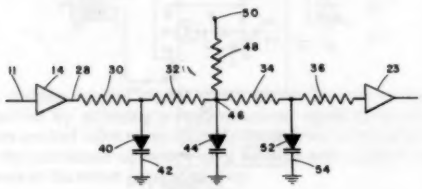


node is connected through a first lead containing which is gate connected to a capacitor and it is also connected through a pair of resistor elements to the same capacitor. Between each pair of resistor elements is a second lead connected to the first lead and to ground through a transistor whose gate is connected to a single clock.

3,748,499
VOLTAGE VARIABLE NON-INDUCTION PHASE SHIFTER WITH MONOLITHIC IMPLEMENTATION

Gerald Schaffner, La Mesa, Calif., assignor to Teledyne Ryan Aeronautical, Division of Teledyne Industries, Inc., San Diego, Calif.

Filed Dec. 20, 1971, Ser. No. 209,529
Int. Cl. H03k 3/35
U.S. Cl. 307—295 4 Claims

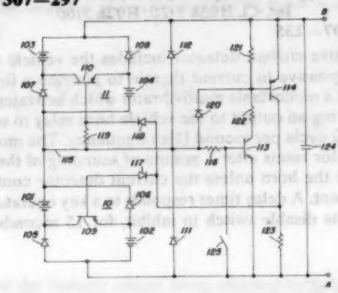


A voltage variable RC phase shifter incorporating reverse bias P-N junctions functioning as voltage variable capacitors in conjunction with resistance elements to produce a phase shift variation up to a maximum of 90°. The degree of phase shift over that range is controlled by controlling the DC reverse bias. The fact that the phase shifter does not require inductances makes it possible to produce a monolithic implementation of the circuit. According to the invention, this implementation makes the use of double diffusion in the semiconductor layers to produce a hyper-abrupt junction and results in the capability of producing a relatively large change in capacitance with a small change in the bias potential.

3,748,500
MULTIPLE REDUNDANT POWER SUPPLY

Ford Tam, 810 Chestnut St., Birmingham, Mich.

Filed Dec. 22, 1971, Ser. No. 210,720
Int. Cl. H03k 1/12; H02j 9/04
U.S. Cl. 307—297 8 Claims

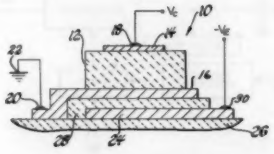


A multiple redundant power supply for supplying a substantially constant voltage to output terminals is disclosed in accordance with the teachings of the present invention. A first pair of voltage sources is coupled to one output terminal and a second pair of voltage sources is coupled to another output terminal and connected in series with the first pair of voltage sources. Steering diodes are provided such that a series connection obtains between either one of the voltage sources included in the first pair and either one of the voltage sources included in the second pair. First switch means interconnects the voltage sources included in the first pair and is adapted when activated to provide a series connection between the first pair voltage sources. Second switch means interconnects the voltage sources included in the second pair and is adapted when activated to provide a series connection between the second pair of voltage sources. The first or second switch means are activated by voltage detecting means coupled to the output terminals upon detection of a failure of the second pair or first pair of voltage sources, respectively.

3,748,501
MULTI-TERMINAL AMORPHOUS ELECTRONIC CONTROL DEVICE

Hellmut Fritzsche, Chicago, Ill.; Stanford R. Ovshinsky; Robert F. Shaw, both of Bloomfield Hills, Mich.; Marvin Silver, and Pavel Smejtek, both of Chapel Hill, N.C., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 139,004, April 30, 1971, abandoned. This application Sept. 27, 1971, Ser. No. 184,179
Int. Cl. H03k 3/26
U.S. Cl. 307—299 18 Claims



A three-teminal electronic control device comprising a body of essentially amorphous, semiconducting material defining a primary current path, and a voltage controlled electron emitter interfaced with the body through a thin electrode and an insulator layer to selectively vary the conductivity of the body by injecting high energy charge carries into the body through the electrode. Various applications are disclosed.

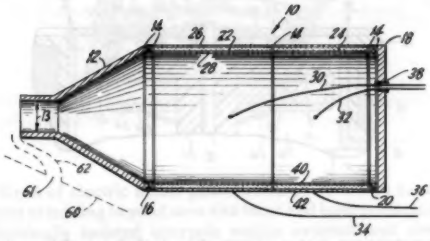
3,748,502

PIEZOELECTRIC HELMHOLTZ RESONATOR FOR ENERGY CONVERSION

Julius Bernstein, Beechhurst, N.Y., assignor to Edo Corporation, College Point, N.Y.

Continuation of Ser. No. 3,249, Jan. 15, 1970, abandoned.
This application Aug. 4, 1971, Ser. No. 169,111
Int. Cl. H04r 17/00
U.S. Cl. 310—8 9 Claims

A Helmholtz resonator comprising an orifice and an otherwise enclosed volume includes one or more cascaded hollow piezoelectric cylinders. The resonator effects a conversion between an air flow and electrical energy, one energy form being applied as an input to excite the resonator and the other energy form being directly derivable as an output.

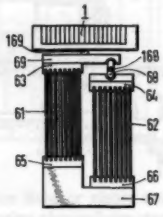


3,748,503

PIEZO ELECTRIC MOTOR

Christian Cobarg, Steinbach; Erich Fenner, Gauting; Max Guntersdorfer, Munich; Walter Heywang, Neukeferloh; Franz Otto, Munich; Rudolf Schofer, Ebersberg, and Helmut Thomann, Munich, all of Germany, assignors to Braun AG and Siemens Aktiengesellschaft, both of Berlin and Munich, Germany, a part interest.

Filed Sept. 10, 1971, Ser. No. 179,449
Claims priority, application Germany, Sept. 11, 1970, P 20 45 108.5; Sept. 11, 1970, P 20 45 152.9
Int. Cl. H01v 7/00
U.S. Cl. 310—8.6 4 Claims



A piezo electric motor having a reciprocating mechanical output driven by a bank of piezo ceramic bending strips, one end of each bending strip being secured in a stationary bed and the other end of each bending strip being connected to a driven member which is reciprocated by the repeated flexing of the bending strips.

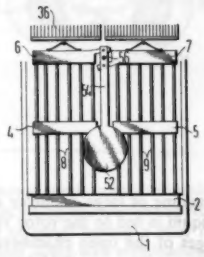
3,748,504

PIEZOELECTRIC MOTOR

Max Guntersdorfer, Munich, and Walter Heywang, Neukerferloh, both of Germany, assignors to Siemens AG, Berlin and Braun AG, Munich, Germany

Filed Feb. 16, 1972, Ser. No. 226,740
Claims priority, application Germany, Feb. 17, 1971, P 21 07 590.1
Int. Cl. H04r 17/00
U.S. Cl. 310—8.2 2 Claims

A piezoelectric motor, in particular a vibrator, for producing essentially straight line movements of a part, in which a plurality of piezoelectrically excitable bending strips are mutually mechanically connected in parallel as a package between the part to be moved and a fixed part. The motor is particularly suited for use in an electric dry shaver and has high mechanical power and efficiency, less noise and less weight than prior piezoelectric motors.

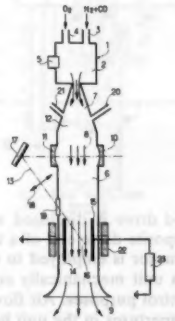


3,748,505

MHD GENERATOR WITH LASER AUGMENTATION

Bernard Lavarini, Paris, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Sept. 18, 1972, Ser. No. 289,919
Claims priority, application France, Sept. 17, 1971, 7133616
Int. Cl. H02k 45/00
U.S. Cl. 310—11 1 Claim

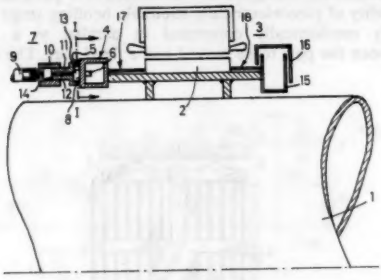


An electric generator comprising a compressed and excited gas supply flowing at high speed in an optical resonating cavity to form a laser, the gas then passing between two electrodes. A magnetic field is applied between these two electrodes, and the laser beam is focused in the interelectrode space to increase the electronic density of the gas. A high potential is thus produced between the electrodes.

3,748,506
ELECTRIC MACHINE OF LARGE DIAMETER AND LOW ROTATIONAL SPEED HAVING A LIQUID-COOLED ROTOR

Karl Lang, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 20, 1971, Ser. No. 209,937
Claims priority, application Germany, Dec. 22, 1970, P 20 64 821.9
Int. Cl. H02k 9/00
U.S. Cl. 310—53 5 Claims

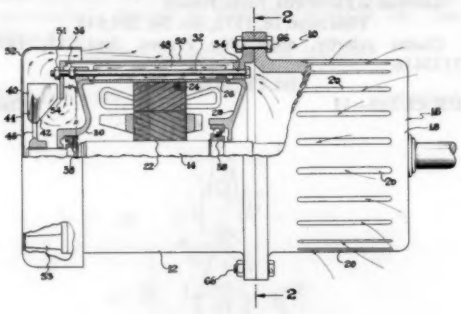


In an electric machine of large diameter and low speed of rotation, cooling liquid is fed to the rotor via standing, open chambers. The edges of the open chambers rest against the plane end face of a rotating manifold having check valves, providing a seal.

3,748,507
VARIABLE SPEED DRIVE HAVING ENHANCED VENTILATION

Robert L. Sieber, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 2, 1971, Ser. No. 204,172
Int. Cl. H02k 9/00
U.S. Cl. 310—58 6 Claims

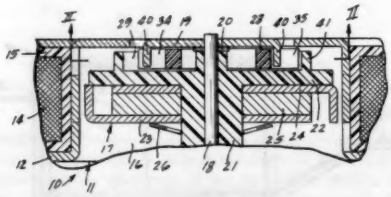


A variable speed drive is disclosed wherein a single fan mounted at the opposite drive end of a totally enclosed constant speed drive motor is employed to cool both the motor and a transmission unit mechanically coupled to the motor shaft for speed control purposes. Air flows into the transmission unit through apertures in the unit housing and the air is drawn through openings in the end shield separating the motor from the transmission unit to pass axially along an annular zone situated between the finned motor frame and an exteriorly disposed cylindrical shell. A baffle situated at the end of the annular zone remote from the transmission unit then passes the air radially inward before the air is propelled radially outward by the fan to be directed by the fan cover axially down the outer surface of the shell. Desirably, the motor end shield remote from the transmission tapers axially toward the rotor with radial departure from the motor frame to provide substantially uniform air flow resistance throughout the drive.

3,748,508
MOTOR CONSTRUCTIONS INCLUDING A SLIDING STOP MEMBER

Lee A. Woolley, Kokomo, Ind., assignor to The Scott & Fetzer Company, Kokomo, Ind.

Filed Aug. 26, 1971, Ser. No. 175,100
Int. Cl. H02k 7/10
U.S. Cl. 310—41 10 Claims

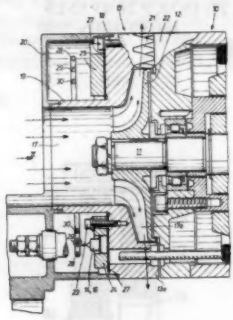


Asynchronous motor construction includes a sliding stop member for achieving unidirectional rotation, the motor having a rotor that includes a radially projecting ear integral with a rotor flange, and a stop member disposed between the rotor flange and the frame of the motor, the stop member having two pair of spaced parallel guide ears, each said pair defining a guide slot which receives guide means on the motor frame that project into such guide slots.

3,748,509
VEHICLE POWER SUPPLY ARRANGEMENT WITH DISCRETE RECTIFIER UNIT

Walter Karcher, Hemmingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 12, 1972, Ser. No. 217,194
Claims priority, application Germany, Jan. 13, 1971, P 21 01 267.9
Int. Cl. H02k 11/00
U.S. Cl. 310—68 D 16 Claims



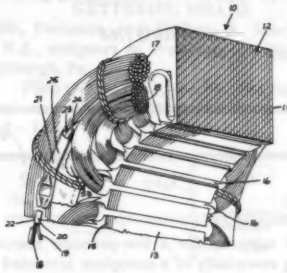
An alternator includes a housing, and a rectifier unit for the electrical users and a battery of the vehicle is constructed as a separate entity, having a casing with the rectifying circuit and the rectifiers of the circuit all mounted in the casing, and with the casing being releasably secured to the axial end of the alternator. On the output shaft of the alternator a separate impeller is mounted which extends into the rectifier unit and cools the same.

3,748,510

DYNAMOELECTRIC MACHINE WINDING CONNECTION INSULATOR

Walter P. McNeal, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 26, 1971, Ser. No. 192,204
Int. Cl. H02k *11/00*
U.S. Cl. 310—71 10 Claims



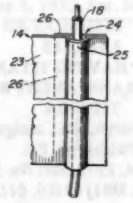
Coils of electric motor phase windings on a core have end turns extending beyond core end faces and have protected and electrically isolated interpole and/or external lead connections. The isolation and protection is provided by an insulator having at least one substantially enclosed receptacle open only at one or both ends thereof. Insulators in one form include a first connection receptacle wall portion formed from a single thickness of material; a second connection receptacle wall portion of a double thickness of material; and means for positively anchoring the insulator in a desired position relative to the winding end turns. In a preferred illustrated form, the connection insulator may include receptacles for receiving two separate winding connections that are to be insulated from each other, and includes an insulation barrier between the two receptacles.

3,748,511

STATOR LEAD ANCHORING AND SPLICE-INSULATING SLOT INSULATOR STRUCTURE AND METHOD

William A. Crabb, Kent, Ohio, assignor to Ametek, Inc.

Filed Dec. 13, 1971, Ser. No. 207,454
Int. Cl. H02k *11/00*
U.S. Cl. 310—71 10 Claims



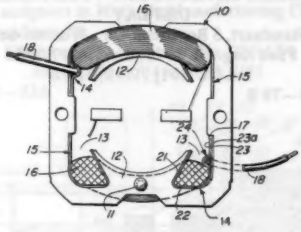
An electric motor field or stator core slot insulating liner having a lead enclosing channel structure receives, and during coil winding holds, an insulated stator lead with one end slightly projecting for splicing thereto of a corresponding coil magnet wire end after completion of coil winding. The spliced lead end is drawn into the channel, thus affording splice insulation and lead anchoring; any subsequent stator impregnation with insulating varnish contributing to splice insulation and to lead anchoring effect of magnet coil pressure against the liner and channel. After winding lead insertion at times is preferable.

3,748,512

STATOR LEAD ANCHORING SLOT INSULATOR

William A. Crabb, Kent, and James L. Flynn, Cleveland, both of Ohio, assignors to Ametek, Inc., New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 228,093
Int. Cl. H02k *3/36*
U.S. Cl. 310—71 3 Claims



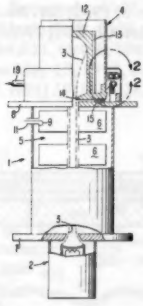
In an electric motor stator core slot insulating liner including a stator lead enclosing and anchoring channel structure on a liner outer side or panel having a liner retaining edge engagement with a slot outer wall terminating shoulder and the channel structure including a flap formed by a liner stock folded along said edge back upon itself, the improvement of a cut score in said edge on the outward side of the fold line region to provide a flat, squared shoulder engaging edge and a more easily produced initially flat-lying flap.

3,748,513

HIGH FREQUENCY BEAM TUBE HAVING AN R.F. SHIELDED AND INSULATED COLLECTOR

Martin E. Levin, Burlingame, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed June 16, 1969, Ser. No. 833,516
Int. Cl. H01j *1/02, 7/24, 23/02*
U.S. Cl. 313—30 6 Claims



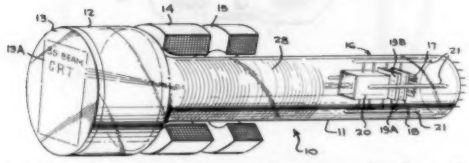
A high frequency velocity modulated beam tube is disclosed having a beam collector structure insulated from the body of the tube. A high frequency conductive housing surrounds the insulator structure to prevent stray radiation from the tube. A wave energy attenuator is disposed in the housing to minimize excitation of high Q resonant modes in the housing. The attenuator comprises plural turns of a dielectric conduit having a cooling liquid flowing therethrough. In a preferred embodi-

ment the conduit forms the attenuator which is cooled by the liquid. In another embodiment the coolant is lossy to form the attenuator.

3,748,514
MULTI-BEAM CATHODE RAY TUBE CHARACTER DISPLAY

Adrian W. Standaart, 5 Bonbrook Cir., Winston-Salem, N.C.

Filed Aug. 18, 1971, Ser. No. 172,756
Int. Cl. H01j 29/50, 31/16
U.S. Cl. 313—70 R **4 Claims**

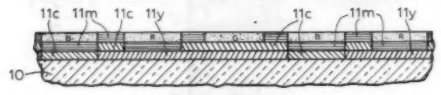


A multi-beam cathode ray tube having a cathode with six-sided channels defining a substantially honeycomb type structure having electron emission coatings on flat faces thereof lying in a single plane and facing the target area. Grid and anode panels having plural rows of plural apertures paralleling and alined with the flat faces form the plural beams, and a graient field helical anode eliminates divergence of the beams from each other arising from like charges.

3,748,515
COLOR TELEVISION PICTURE TUBE WITH SUBTRACTIVE COLOR FILTERS

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 3, 1972, Ser. No. 240,568
Int. Cl. H01j 29/26
U.S. Cl. 313—92 B **7 Claims**



The screen of a three gun shadow mask type of color picture tube is formed of three filters each predominantly transmissive of magenta, yellow and cyan which are the respective complements of the primary colors green, blue and red. Each filter covers the faceplate except in image areas assigned to its complementary primary phosphor. Each image area thus includes two overlying filters cooperating to allow transmission of light associated with its assigned primary color. The spaces between image areas are covered by all three complementary filters and are substantially opaque to visible light.

3,748,516
LOW-PRESSURE MERCURY VAPOUR DISCHARGE LAMP

George Blasse, and Jaap De Vries, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

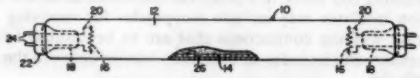
Division of Ser. No. 834,285, June 18, 1969, Pat. No. 3,586,637. This application Feb. 16, 1971, Ser. No. 115,787
Claims priority, application Netherlands, June 22, 1968, 6808846
Int. Cl. H01j 1/63
U.S. Cl. 313—109 **4 Claims**

Luminescent material for a low-pressure mercury vapor lamp consisting essentially of a europium activated strontium or barium boro-phosphate.

3,748,517
GENERAL ILLUMINATION FLUORESCENT LAMP WHICH ACCENTS THE COLOR OF GREEN OBJECTS

Harry H. Haft, Whippany, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 12,705, Feb. 19, 1970, abandoned. This application Sept. 10, 1971, Ser. No. 179,354
Int. Cl. H01j 1/63
U.S. Cl. 313—109 **4 Claims**

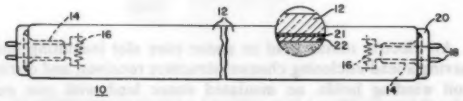


Low-pressure fluorescent lamp emits a wide range of visible radiations which provide good color rendition of all illuminated objects, while simultaneously accentuating the color of green objects. This is accomplished by utilizing a phosphor blend of a broad-band-emitting phosphor which peaks in the blue, a broad-band-emitting phosphor which peaks in the orange, and a narrow-band-emitting phosphor which peaks in the green.

3,748,518
FLUORESCENT LAMP HAVING TITANIA-DOPED GLASS ENVELOPE WITH TRANSPARENT BUFFER FILM OF TITANIA

Daniel W. Lewis, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,873
Int. Cl. H01j 61/30, 61/35
U.S. Cl. 313—109 **10 Claims**



The light output and lumen maintenance of a fluorescent lamp having a bulb composed of soda-lime silicate glass are enhanced by doping the glass with a controlled amount of titania and vapor-depositing a thin transparent film of TiO_2 on the inner surface of the bulb at the phosphor-glass interface. The titania film has a thickness of from 0.01 to 0.02 micron

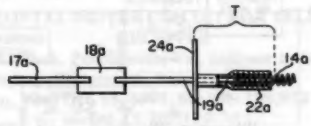
and serves as a "buffer layer" which, reflects ultraviolet radiation and, in conjunction with the titania in the glass, thus inhibits the solarization of the bulb and deleterious chemical reactions at the bulb surface. Optimum lamp performance is thus obtained with a minimum amount of titania.

3,748,519

TUBULAR HEAT LAMP HAVING INTEGRAL GETTERING MEANS

Jack Martin, Paramus, and William A. Murray, Fanwood, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1971, Ser. No. 186,968
Int. Cl. H01k 1/54
U.S. Cl. 313—178 **8 Claims**



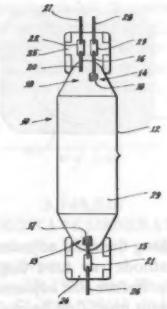
The helical filament coil of a tubular infrared type electric lamp is suspended within the quartz envelope by a series of spaced tungsten-wire spiral supports and gettering of gaseous impurities within the lamp is achieved by a separate member of tantalum (or other material) that is locked in contact with and is thus heated by the end of the filament coil. The gettering component is of elongated configuration and so arranged relative to the end of the filament coil and its attached lead-in wire that the gettering component extends along the gradient-temperature zone established at that location when the filament is energized — thereby insuring that at least a portion of the gettering material is heated to a predetermined temperature (preferably from about 600° to 1,000°C in the case of tantalum).

3,748,520

ELECTRIC DISCHARGE LAMP HAVING A FILL INCLUDING NIOBIUM PENTAIODIDE COMPLEXED WITH AN INORGANIC OXO-COMPOUND AS THE PRIMARY ACTIVE COMPONENT

H. Graham Silver, Kings Point, N.Y., assignor to General Telephone & Electronics Laboratories Incorporated, New York, N.Y.

Filed May 5, 1972, Ser. No. 250,648
Int. Cl. H01j 61/18
U.S. Cl. 313—184 **22 Claims**



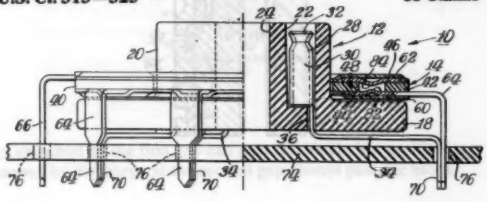
An electric discharge device comprising a sealed light-transmissive envelope; and a fill within the envelope, the fill including, as the primary light-emitting material, niobium pentaiodide complexed with an inorganic oxo-compound, particularly an oxytriiodide of a Group VA element or an oxydiiodide of a Group VIA element.

3,748,521

ENVIRONMENTALLY CONTROLLED VIDEO TUBE SOCKET ASSEMBLY UTILIZING SPARK GAP UNIT

George C. Wright, Barrington; Charles Kozel, McHenry; Nathan Baraglia, Stone Park, and Ed Marciszewski, Berwyn, all of Ill., assignors to Methode Manufacturing Corporation, Rolling Meadows, Ill.

Filed Aug. 31, 1972, Ser. No. 285,454
Int. Cl. H01j 5/46; H02h 9/06
U.S. Cl. 313—325 **18 Claims**



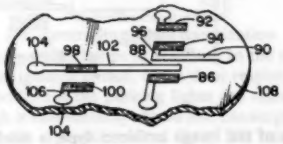
This invention is directed to a tube socket assembly including an environmentally sealed spark gap unit for protection against high voltage surges which may be either regular atmosphere, evacuated or gas filled. The tube socket assembly is composed of a tube receiving unit and a spark gap unit. The tube receiving unit has a socket body formed of insulating material with a plurality of terminal pin-receiving openings. A current conducting contact is mounted within each of the terminal pin-receiving openings and current conducting leads extend from these contacts through the socket body for external connection. The spark gap unit has an encapsulated housing of insulating material which contains a conducting plate and a plurality of spaced electrodes. An insulating wafer separates the electrodes from the plate and has a plurality of openings aligned with each of the electrodes. Terminal means are provided for electrically connecting the electrodes to the current conducting leads of the tube receiving unit.

3,748,522

INTEGRATED VACUUM CIRCUITS

Donovan V. Geppert, Sunnyvale, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Division of Ser. No. 864,031, Oct. 6, 1969, Pat. No. 3,701,919.
This application May 17, 1972, Ser. No. 254,319
Int. Cl. H01j 19/18, 1/24, 19/44
U.S. Cl. 313—310 **1 Claim**

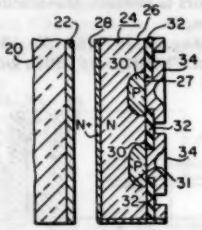


An integrated circuit operative in vacuum and having all circuit elements formed in coplanar fashion on a single surface of a substrate to provide superior performance even in the presence of adverse environmental conditions. The circuit is especially adapted to microminiaturization and includes a unique electron discharge device having coplanar electrodes easily formed on a substrate surface by relatively simple film deposition techniques.

3,748,523
BROAD SPECTRAL RESPONSE PICKUP TUBE

Rolf R. Beyer, Horseheads; Peter R. Collings, Ithaca, and Alfred B. Laponsky, Horseheads, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1971, Ser. No. 168,912
Int. Cl. H01j 31/26
U.S. Cl. 315—10 5 Claims

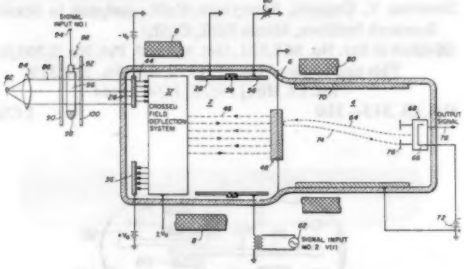


A broad spectral response pickup tube incorporating a photoemissive cathode responsive to a first range of wavelengths of radiation with proximity focusing providing for the electron emission from the photocathode onto an electron responsive target. The input window and the photoemissive cathode being transmissive to a second range of wavelengths of radiation focused onto said electron responsive target in which said electron responsive target is also responsive to the second range of radiation wavelengths.

3,748,524
IMAGE CORRELATOR TUBE WITH CROSSED FIELD DEFLECTION

John M. Osepchuk, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 14, 1970, Ser. No. 71,956
Int. Cl. H01j 31/48
U.S. Cl. 315—11 2 Claims

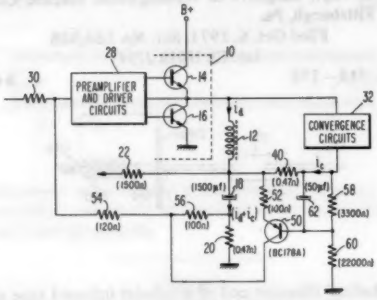


A device of the image orthicon type is disclosed for electrooptical integration and correlation systems utilizing a crossed electric and magnetic field deflection region and a retarding potential filter. The crossed electric and magnetic fields deflect a beam of primary electrons from a photoemissive cathode for the conversion of collimated light input signals within the electron image section which results in the emission of secondary electrons impinging on a target member. The retarding potential filter is biased at a potential to optimize the effective secondary electron emission ratio relative to the primary photoelectrons.

3,748,525
VERTICAL CONVERGENCE CIRCUITS UTILIZING POSITIVE FEEDBACK FOR STABILIZATION

Cyril John Hall, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1972, Ser. No. 219,715
Claims priority, application Great Britain, July 5, 1971, 31,463/71
Int. Cl. H01j 29/50
U.S. Cl. 315—13 C 5 Claims

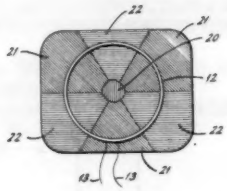


Transformerless vertical deflection circuits often employ negative feedback to linearize its amplifier operation. Where a vertical convergence circuit is coupled in parallel with the vertical deflection yoke, such negative feedback stabilizes the sum of the currents flowing in the deflection yoke and convergence circuit, but undesirably permits adjustments in the convergence current to adversely affect picture height and/or linearity by causing the deflection current to vary in an opposite manner. Arrangements are herein described for maintaining the parallel coupling of the vertical convergence circuit with its deflection yoke, but in a manner to eliminate the convergence current from the feeback-loop which then stabilizes the deflection current only.

3,748,526
COLOR CATHODE RAY TUBE DEFLECTION YOKE ADJUSTMENT

Werner F. Wedam, Hatfield, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Apr. 7, 1972, Ser. No. 242,015
U.S. Cl. 315—13 CG 5 Claims



A process for making the axial adjustment of the deflection yoke on a color cathode ray tube display assembly of the shadow mask variety. Before this adjustment is attempted, the color purity adjustment must first be made. This involves disabling two of the three electron guns and then, by known manipulation of the "color purity magnets" causing the beam landings to coincide with the correct phosphor dots in the center of the tube. The deflection yoke is then adjusted while normal operating potentials are applied to the tube, except for the disabled guns, normal deflection signals are supplied to the

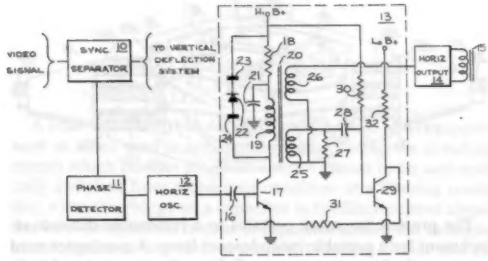
yoke, and an axial magnetic field is applied at the tube faceplate. The axial field is made strong enough to shift non axial electron beams to the adjacent phosphor dots thereby creating a color display pattern having radial components of a color corresponding to that of one or more of the two disabled electron guns. When the deflection yoke is correctly positioned, the radial pattern components will be symmetrical and will have straight lines. Incorrect adjustment will result in skewed or curved components. The yoke is moved to achieve a pattern having the highest degree of symmetry and straight edges.

3,748,527

HORIZONTAL DRIVER CIRCUIT FOR TELEVISION RECEIVER

Mervyn M. Pluck, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Oct. 13, 1971, Ser. No. 188,932
Int. Cl. H01j *29/70*
U.S. Cl. 315—26 **4 Claims**



A system for producing a horizontal deflection drive pulse having a closely regulated duration. A driver transistor is coupled to the primary winding of a transformer, and is adapted to receive periodic pulses from an oscillator. A second, timer transistor is operated by signals derived from a secondary winding of the transformer and serves to regeneratively drive the first transistor into full conduction. An R–C timing circuit coupled to the base of the timer transistor serves to determine the period of time for which the timer transistor maintains the driver transistor in a conductive state. The duration of the pulse produced by the driver transistor is thus primarily a function of the R–C timing circuit characteristics, and remains substantially constant in the presence of variations in supply voltage, in the characteristics of the driver or timer transistors, or in the presence of variations in the waveshape of the periodic pulses provided by the oscillator.

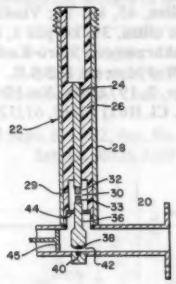
3,748,528

MICROWAVE GENERATOR

Harry Cronson, Lexington, Mass., assignor to Ikor Incorporated, Burlington, Mass.

Filed Mar. 23, 1972, Ser. No. 237,278
Int. Cl. H01j *25/12, 25/16*
U.S. Cl. 315—39 **8 Claims**

A high-power, X-band microwave burst generator having an input coaxial line feeding a post extending into a waveguide. The center conductor of the coaxial line has a first switching gap therein and the post terminates at an end spaced, by another switching gap, from the interior wall of the waveguide. An RF block is disposed around the post adjacent the first switching gap. The gaps are dimensioned so that energy switched by the first gap can pass the block, but oscillations caused by discharge at the second gap cannot pass the block.

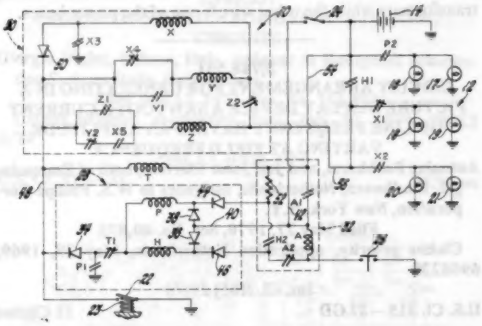


3,748,529

LIGHT CONTROL CIRCUIT

Richard P. Ballou, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 16, 1972, Ser. No. 253,783
Int. Cl. B60q *1/04*
U.S. Cl. 315—83 **3 Claims**

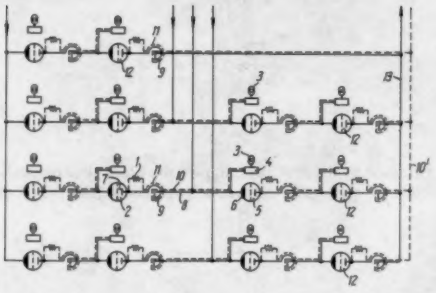


Apparatus for controlling the energization of vehicle headlamps and parking lamps in response to the settings of a light switch, an ignition switch, and a door responsive switch. In a first embodiment the parking lights are energized when the light switch is momentarily closed and deenergized when it is held closed for a predetermined time. The headlamps are similarly energized and deenergized when the ignition switch is in a vehicle operative setting. Momentary closure of the light switch while the headlamps are energized alternately energizes bright and low beam headlamps. The parking lamps and headlamps are automatically extinguished when the vehicle door is opened after the ignition switch is placed in a vehicle inoperative setting. In a second embodiment additional time delay circuitry is provided for maintaining the vehicle lamps energized for a predetermined time after the operator has left the vehicle.

3,748,530
DEVICE FOR ELECTRIC HEATING OF THE ANODES IN HIGH-VOLTAGE MERCURY-ARC RECTIFIERS

Alexandr Mikhailovich Berkovsky, Nizhne-Krasnoselskaya ulitsa, 45, kv. 244; Veniamin Efimovich Turetsky, Nizhne-Krasnoselskaya ulitsa, 45, kv. 90; Vladimir Petrovich Kulakov, 5 Parkovaya ulitsa, 39, korpus 1, kv. 46, and Leonid Alexandrovich Vakhrameev, Staro-Kashirskoe shosse, 4, korpus 1, kv. 17, all of Moscow, U.S.S.R.

Filed Nov. 2, 1971, Ser. No. 194,971
Int. Cl. H01j *13/18, 61/52*
U.S. Cl. 315—114 **1 Claim**

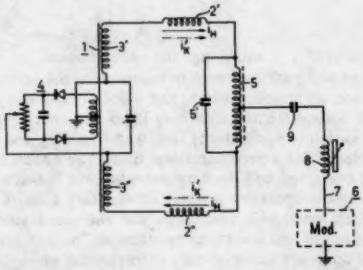


Device for electric heating of the anodes in high-voltage mercury-arc rectifiers, used in bridge converters of d.c. substations each bridge arm contains series-connected rectifiers, each having an anode reactor, an individual isolating auxiliary-power transformer and a built-in electric anode heater; the latter draws its power from the individual isolating transformer of an adjacent rectifier in the same phase, the cathode of which is at the same potential as the anode being heated, and said reactor has an additional isolated winding which connects said heaters to one of the wires of the individual isolating transformers while the other wire is one of the power buses.

3,748,531
CIRCUIT ARRANGEMENT FOR GENERATING IN A PICTURE DISPLAY DEVICE A SAWTOOTH CURRENT OF LINE FREQUENCY HAVING AN AMPLITUDE VARYING AT FIELD FREQUENCY

Antonius Boekhorst, and Jan Joost Rietveld, both of Emmasingel, Eindhoven, Netherlands, assignors to W.S. Philips Corporation, New York, N.Y.

Filed May 27, 1970, Ser. No. 40,873
Claims priority, application Netherlands, May 29, 1969, 6908228
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **11 Claims**

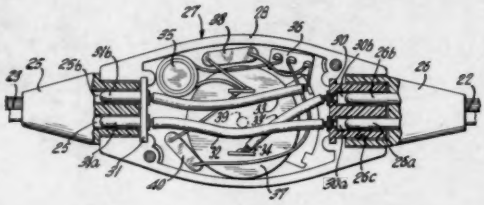


A circuit arrangement for generating by means of a modulator in a colour picture display device a sawtooth correction current of line frequency flowing through the line deflection coils and having an amplitude varying at field frequency for the purpose of obtaining a better colour superposition in the corners of the screen of the display tube, comprising means to add an additional correction current which flows in the same direction as the first mentioned current and which is proportional to the third power of both the line and the field deflection currents. Said means may be a saturable coil or a resonant circuit which is tuned to a frequency which lies between the like frequency and twice the value thereof. In the latter case the voltage present across the circuit may be used for correcting the North-South pincushion distortion. Also, the modulator is controlled by an amplifier comprising a linear and a voltage-dependent resistor which ensure that a third-power component is added also to said field deflection current.

3,748,532
REMOVABLE DIMMER ATTACHMENT FOR A PORTABLE LAMP

Saul Rosenbaum, East Meadow, N.Y., assignor to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,303
Int. Cl. H05b *37/02*
U.S. Cl. 315—362 **6 Claims**

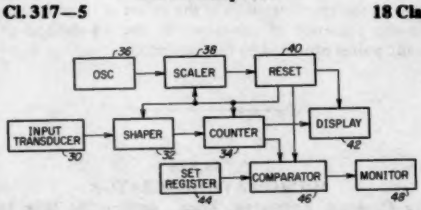


The present invention pertains to a removable dimmer attachment for a portable incandescent lamp. A conductor cord connects the lamp to a source of alternating current and is divided into two sections. The two sections of the lamp cord are connected by a plug and receptacle for operation of the lamp in the normal manner. The removable dimmer attachment is connected between the two sections of the lamp cord when desired and provides variable control over the level of illumination from the lamp. The connections between the two sections of the lamp cord and the connections of the lamp cord to the dimmer attachment are polarized.

3,748,533
DIGITAL TACHOMETER

Robert F. South, Dallas, Tex., assignor to Beta Engine Systems Corporation, Watertown, Mass.

Filed Jan. 31, 1972, Ser. No. 222,173
Int. Cl. G01p *3/00*
U.S. Cl. 317—5 **18 Claims**



A digital tachometer which is compact, highly reliable, and economically implemented with conventional circuitry including in combination with transducer means for generating a pulsed signal, a decade counter, timing means for determining a timing period, and control means whereby said counter accumulates count during the timing period. Display means

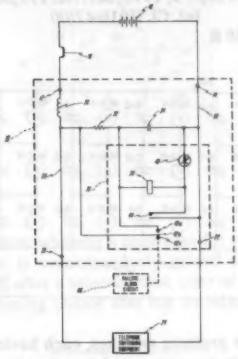
receives and displays the count at the end of a timing period, and monitor means receives and compares the accumulated count with programmed set points or limits.

3,748,534

FILTER-CONTROL CIRCUIT

Roy W. Jones, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed July 11, 1972, Ser. No. 270,749
Int. Cl. H02h 7/16
U.S. Cl. 317—12 B 9 Claims



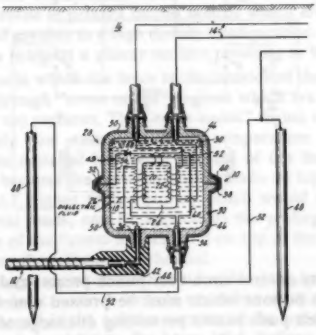
A filter-control circuit for incorporation into power supplies such as those used in telephone systems, includes a switching circuit which enables the filter-control circuit to be automatically switched from a charging condition to a filtering condition when the charge on a capacitor in the filter-control circuit has been established. In case of capacitor failure the switching circuit operates to swtich in a current limiting circuit into the circuit to maintain operation of the system until the circuit can be withdrawn from service for repair. Alarm means may be provided to signal any occurrance of a breakdown of the capacitor.

3,748,535

WATER COOLED DIRECT BURIED ELECTRICAL EQUIPMENT

Rolland D. Nelson, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Jan. 3, 1972, Ser. No. 214,563
Int. Cl. H02h 7/04
U.S. Cl. 317—15 10 Claims



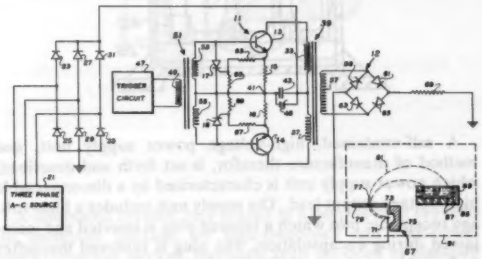
An apparatus for attracting or drawing water toward the surface of a direct buried enclosure for electrical equipment, the enclosure having an electrically conductive outer surface connected to a source of DC potential within the enclosure and a ground rod connected to the neutral of the electrical system and buried in a spaced relation to the enclosure, the surface of the enclosure being anodic with respect to the ground rod whereby water in the vicinity of the ground rod will be attracted toward the surface of the enclosure.

3,748,536

POWER SUPPLY

Sigurd Andresen, Redwood City, Calif., assignor to Airco, Inc., New York, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,454
Int. Cl. H02h 3/08
U.S. Cl. 317—16 6 Claims



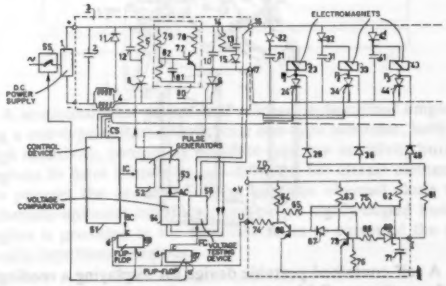
A power supply is described for an electron gun employed in an electron beam furnace system wherein the gun current is susceptible of rising upon the occurrence of an arc. Switching means including at least one transistor are coupled between the current source and the electron gun. The current through the transistor is sensed and control means operate to disable the transistor upon a rise in the current due to an arc.

3,748,537

PROTECTION DEVICE FOR HAMMER DRIVING CIRCUITS

Giorgio Vigini, Milano, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed July 12, 1971, Ser. No. 161,580
Claims priority, application Italy, July 30, 1970, 28063 A/70
Int. Cl. H02h 3/24
U.S. Cl. 317—31 7 Claims



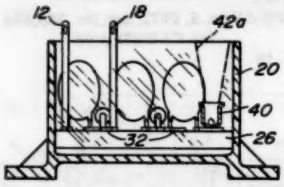
The protection of a plurality of current pulse circuits, for example of the type used to activate high speed print hammers, is provided by a device which monitors the voltage levels at an appropriate terminal of each circuit. If the voltage level is not within predetermined limits in a suitable time interval, a signal is generated by the device which interrupts the power supply, thereby preventing damage to the circuitry, and/or activates an alarm. This device can also detect certain types of faults before the current pulse circuits have been energized.

3,748,538

ENCAPSULATED HIGH VOLTAGE POWER SUPPLY WITH DISCONNECTABLE HIGH VOLTAGE OUTPUT LEAD AND METHOD OF MAKING SAME

Hart Shekerjian, and George A. Louis, both of Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 30, 1972, Ser. No. 239,608
Int. Cl. H05k 5/06
U.S. Cl. 317—118 7 Claims



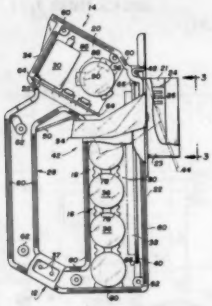
A self-contained, high-voltage power supply unit, and method of manufacture therefor, is set forth and described, which power supply unit is characterized by a disconnectable high-voltage output lead. The supply unit includes a high-voltage receptacle into which a tapered plug is inserted and maintained during encapsulation. The plug is removed thereafter and a cable serving as the high-voltage output lead may be inserted into electrical and mechanical engagement with the high-voltage receptacle member. The high-voltage output lead is maintained in its set position by a tapered split-ring ferrule providing a relatively close fit to the outside diameter of the high-voltage lead and which is force fitted into the channelway in the encapuslated material as formed by the tapered plug.

3,748,539

REMOTE SELF-CONTAINED PORTABLE READOUT DEVICE

Daniel A. Seltzer, Cincinnati, Ohio, assignor to Gamon-Calmet Industries, Inc., Florence, Ky.

Filed Sept. 24, 1971, Ser. No. 183,475
Int. Cl. G08b 5/00; H02b 1/08
U.S. Cl. 317—120 13 Claims



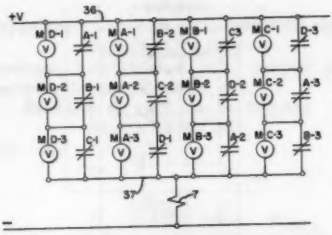
A self-contained portable device for displaying a reading of information available at a receptacle (such as the remotely located receptacle of a remote meter reading system) is disclosed which includes a casing having an interior chamber, with the casing further including an outstanding plug portion for removable connection to the receptacle; display means located in the interior chamber; electrical supply means located in the interior chamber; and electrical circuit means located in the interior chamber and energized by said supply means for causing the display means to display a reading representative of the information. Novel ejection means are also disclosed for facilitating removal of the device from the receptacle into which it is plugged and various constructional features are disclosed for simply and compactly housing the various components of the device and making them available for repair and/or replacement.

3,748,540

TESTING AND MONITORING SYSTEM FOR REDUNDANT TRIP DEVICES

Markus A. Eggenberger, Schenectady, and Charles L. Devlin, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,309
Int. Cl. H01h 47/00
U.S. Cl. 317—135 R 1 Claim



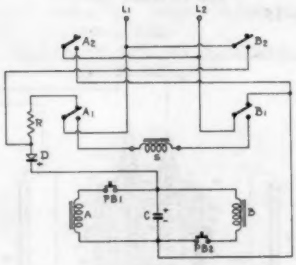
Three or more pressure switches, each having two or more actuated contacts are connected together in a logic circuit with monitoring devices to detect contact failure so as to provide protection to the system while each pressure switch is tested while providing redundancy so that the probability of a trip action not to occur when it should is minimized. Although the principle of operation is illustrated using a pressure sensing trip system as an example, it is broadly applicable to any type of redundant, testable protective system.

3,748,541

ELECTRICAL SAFETY CONTROL CIRCUIT FOR PUNCH PRESSES AND THE LIKE

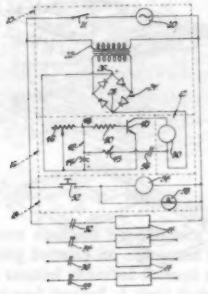
Leon Ginsberg, 19 Hafis Rd., Toronto, Ontario, Canada

Filed July 26, 1972, Ser. No. 275,317
Int. Cl. H01h 47/04
U.S. Cl. 317—135 R 5 Claims



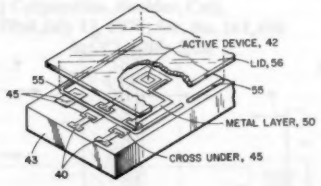
A safety control circuit for punch presses and the like has two push buttons which must be pressed almost simultaneously, each push button permitting discharge of a capacitor through a relay coil, each relay having a normally closed switch connecting the capacitor to a electrical supply and a normally open switch which, when closed, can bypass the normally closed switch of the other relay. The circuit can be arranged to fail safe.

3,748,542
CONTROL SYSTEM
Erhardt H. Heimburg, Flint, Mich., assignor to Industrial Electronic Timer Co., Cheboygan, Mich.
Filed May 24, 1971, Ser. No. 146,119
Int. Cl. H01h 47/18
U.S. Cl. 317—141 S 2 Claims



A control system whereby a controller for varying apparatus control devices is instantaneously turned on or off and/or turned on or off after a selected time interval determined by a transistorized timing circuit that has an adjustable time constant.

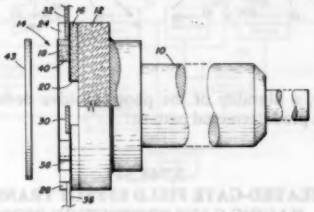
3,748,543
HERMETICALLY SEALED SEMICONDUCTOR PACKAGE AND METHOD OF MANUFACTURE
Donald Keith Roberson, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Apr. 1, 1971, Ser. No. 130,339
Int. Cl. H01l 5/02
U.S. Cl. 317—234 R 15 Claims



There is disclosed a hermetically sealed semiconductor package which is physically thin, allowing mounting within apertures formed in printed circuit boards which are stacked one on top of another in a high density configuration. The hermetic seal is made to a planar surface resulting in high reliability devices in which the leads to the interior of the package are made through "cross under" regions which are provided with planar top surfaces. The "cross under" region is a region of extremely low resistivity, high temperature material. Because this material is utilized as part of the lead to the device and because the hermetic seal is made on top of the "cross under," higher temperatures, which would ordinarily destroy metal leads, can be applied to the sealing material both on top of the "cross unders" and on top of the substrate for increasing the reliability of the seal.

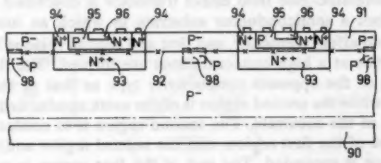
This package replaces the more fragile prior art hermetically sealed devices which include a number of piece parts. A device packaged in the subject manner is also used as a hermetically sealed substitute for beam lead devices, since the subject devices are thin, have a higher reliability than unsealed beam lead devices and are impervious to welding and other contaminants during mounting.

3,748,544
LAMINATED CERAMIC HIGH-FREQUENCY SEMICONDUCTOR PACKAGE
Saul Noren, Hunterdon, N.J., assignor to Plessey, Incorporated, New York, N.Y.
Filed Feb. 14, 1972, Ser. No. 225,734
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 7 Claims



A laminated ceramic ring brazed to a beryllia base provides an improved package for high-frequency and high-power semiconductive devices. Hermetic seals provided by standard metallizing and brazing techniques are better than seals obtained with ceramic-glass seals used heretofore. Electrical connection is provided by conductive paths at the adjoining surfaces of the laminated ring.

3,748,545
SEMICONDUCTOR DEVICE WITH INTERNAL CHANNEL STOPPER
Julian Robert Anthony Beale, Reigate, England, assignor to U.S. Philips Corporation
Filed Aug. 28, 1969, Ser. No. 853,714
Claims priority, application Great Britain, Aug. 30, 1968, 41,476/68
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 4 Claims

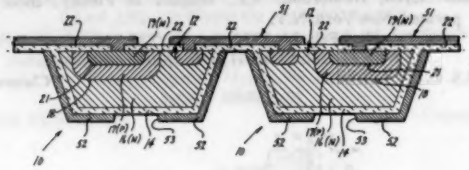


A semiconductor device and method is described employing a one-type epitaxial layer on a one-type substrate, both of high resistivity, containing opposite-type low resistivity buried regions to form islands by out-diffusion for circuit elements. To prevent the occurrence of a parasitic channel along the substrate-epitaxial interface, a one-type highly-doped buried region is provided in the substrate so as to surround the opposite-type buried regions.

3,748,546
PHOTOSENSITIVE DEVICE AND ARRAY
David F. Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.
Filed May 12, 1969, Ser. No. 823,756
Int. Cl. H01l 15/00
U.S. Cl. 317—235 R 12 Claims

Photosensitive device having a back side surface which is provided with a substantially transparent insulating layer and

at least a portion of which is exposed through the layer so that light can enter the phototransistor through the back side. In the array, a plurality of the photosensitive devices are provided in a predetermined pattern.

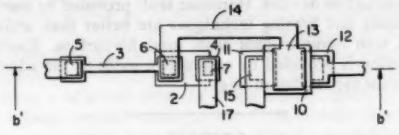


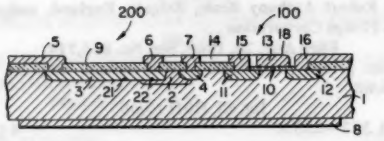
3,748,547

INSULATED-GATE FIELD EFFECT TRANSISTOR HAVING GATE PROTECTION DIODE

Eiji Sugimoto, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed June 21, 1971, Ser. No. 155,047
Claims priority, application Japan, June 24, 1970, 45/55436
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **3 Claims**





An insulated-gate field effect transistor is described which comprises a semiconductor substrate in which an insulated gate field effect transistor, and first and second regions having impurities at a high concentrations are formed. The first region is of the opposite conductivity type as that of the substrate, while the second region is of the same conductivity type as that of the substrate. The second region is in contact with one end of the first region, and the second region and/or the substrate is grounded. The end of the first region in contact with the second region is connected to the gate electrode of the insulated gate field effect transistor, and the other end of the first region is connected to the input electrode.

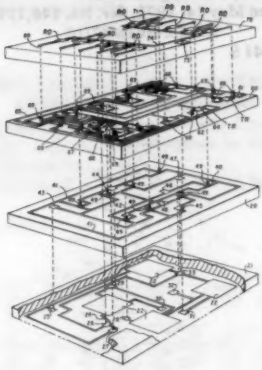
3,748,548

THREE-DIMENSIONAL INTEGRATED CIRCUITS AND METHOD OF MAKING SAME

Robert W. Haisty, Richardson; Rowland E. Johnson, and Edward W. Mehol, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 390,298, Aug. 18, 1964, abandoned.
This application Sept. 3, 1971, Ser. No. 177,812
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **7 Claims**

This invention relates to electrical devices, such as semiconductor networks or integrated circuits. More particularly it relates to circuits of the class described in which a plurality of individual circuit component functions are performed by discrete regions and nondiscrete regions of function-performing



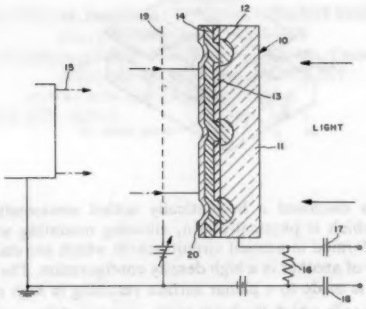
material arranged and operatively interconnected three dimensionally within the structure of a single unit, and to methods of making same.

3,748,549

RESISTIVE SEA FOR CAMERA TUBE EMPLOYING SILICON TARGET WITH ARRAY OF DIODES

Alfred Milch, Teaneck, N.J., and Barry Singer, New York, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,208
Int. Cl. H01l *17/00*
U.S. Cl. 317—235 NA **1 Claim**



A camera tube employing a silicon target with a diode array which is covered with a resistive layer or sea on the side facing the electron beam. The resistive sea consists of a layer of bismuth oxide which protects the silicon target from damage by x-rays while minimizing charge build-up on the insulating layer between diodes which would otherwise prevent beam landing. The resistive sea is covered by a very thin layer of cadmium telluride which stabilizes the Bi_2O_3 layer and improves its beam acceptance properties.

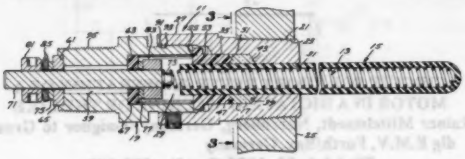
3,748,550

Patent Not Issued For This Number

3,748,551
HIGH TEMPERATURE AND PRESSURE CAPACITANCE PROBE

Oscar J. Petersen, Orange, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 10, 1972, Ser. No. 242,582
Int. Cl. H01g 7/00
U.S. Cl. 317—246 16 Claims

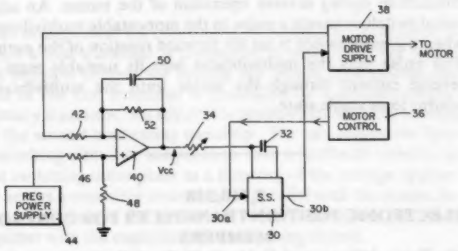


A high pressure resistant capacitance probe including a cylindrical housing forming an elongated first electrical conductor having a coaxial chamber formed therein with a bore leading from one end thereof. A rigid dielectric alumina tube as received on one extremity in such chamber and projects through the bore to form a closed ended sensor. An annular lava seal surrounds the one extremity of the tube and is firmly compressed into sealing engagement between the housing and tube to seal against entry into such chamber of high pressures. A second electrical conductor in the form of a coil spring is received in the tube to project coaxially with the first electrical conductor to cooperate therewith in providing a predetermined capacitance across the dielectric tube whereby contact of a conductive fluid with the sensor end of the tube will alter the capacitance thereof to provide a capacitance change in the wall of such tube thus indicating such fluid contact.

3,748,552
MOTOR CONTROL CIRCUIT FOR TAPE DRIVE

William C. Arthur, Boulder, Colo., assignor to Storage Technology Corporation, Boulder, Colo.

Filed July 12, 1971, Ser. No. 161,480
Int. Cl. H02p 3/20
U.S. Cl. 318—7 5 Claims

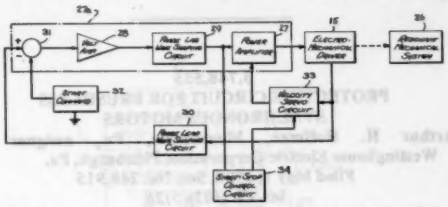


In a computer tape drive system, a fluctuating motor drive voltage is compared with a regulated voltage at the input to an operational amplifier to generate a voltage at the amplifier output for charging the coupling capacitor of a single-shot multivibrator. The single-shot period is then utilized to establish a motor drive period during which the motor drive voltage is applied to the motor. Since the single-shot period is inversely related to the voltage at the amplifier output and therefore inversely related to the motor drive voltage, any fluctuation in motor drive voltage is compensated for by a corresponding inverse change in the motor drive period.

3,748,553
SELF-TUNED VIBRATORY FEEDER

Robert Leopold Reiner, Bethany, Conn., assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Oct. 8, 1971, Ser. No. 187,621
Int. Cl. H02k 33/02
U.S. Cl. 318—128 19 Claims

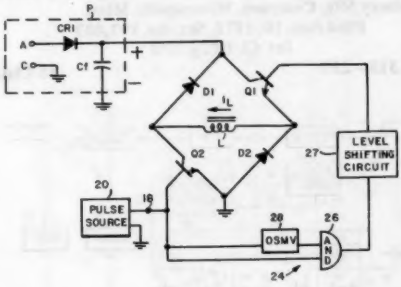


A driver for a vibratory feeder employs a D.C. field structure with an annular air gap in which is disposed concentrically both a stationary coil and a moving coil. The latter coil is mechanically coupled to drive the flexure supported tray. Both coils are connected in series opposition and have substantially zero resultant inductance. The coils, in series, are connected to both the output and input of an amplifier having a single-ended output to provide a self-excited oscillatory loop. A servo amplifier responding to the flyback voltage generated by the moving coil controls the gain of the main amplifier so as to provide for automatic velocity control. An A.C. shunt is selectably applicable to the main amplifier to suppress oscillation while the amplifier is maintained conductive for dynamic braking when a stop command is executed. The oscillatory wave shape is controlled to avoid high frequency components which give rise to acoustic noise.

3,748,554
STEPPING MOTOR DRIVE CIRCUIT PROVIDING COLLAPSING FIELD ENERGY STORAGE

McDonald William C., Belmont, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed May 3, 1971, Ser. No. 139,722
Int. Cl. H02p 9/04
U.S. Cl. 318—138 4 Claims



A drive circuit for supplying current to individual coils of a stepping motor for the duration of a signal pulse, the drive circuit being characterized by a high rate of current decrease in the coil at the end of the signal pulse and efficient use of power sources. The drive circuit has a bridge configuration with the stepping motor coil connected across one bridge diagonal. Connected across the other bridge diagonal is an energizing potential such as a DC power source. Two opposite sides of the bridge have diodes connected therein, the diodes being oriented so as to be back biased by the energizing potential. The remaining two opposite sides of the bridge contain switching transistors, oriented so as to be forward biased by

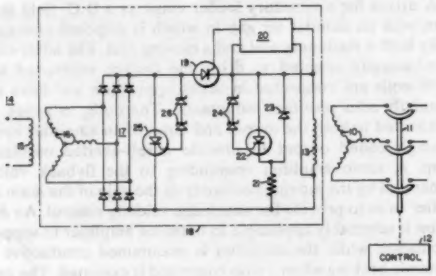
the energizing potential. Switch control means, responsive to the signal pulses, are provided to turn on the switching transistors at the beginning of a signal pulse to energize the coil, and to turn off the transistors at the end of a signal pulse so that the coil will discharge through the diodes back into the energizing potential for storage of the energy of discharge from the coil.

3,748,555

PROTECTIVE CIRCUIT FOR BRUSHLESS SYNCHRONOUS MOTORS

Arthur H. Hoffman, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 1, 1972, Ser. No. 248,915
Int. Cl. H02p *5/28*
U.S. Cl. 318—181 **3 Claims**



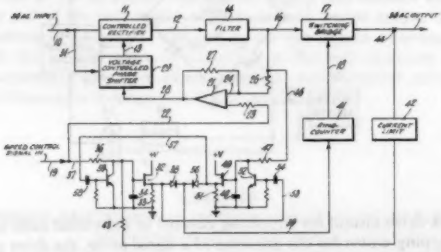
A protective circuit for brushless synchronous motors for protection against failure of a thyristor which controls the direct current excitation of the motor field winding. The circuit consists of a solid-state switch connected to shunt the rectifier which supplies the direct current excitation in response to failure of the thyristor.

3,748,556

A.C. MOTOR SPEED CONTROL SYSTEM FOR TWO INDIVIDUAL LIMITING CIRCUITS THEREIN

Jimmie Douglas Gillett, Garland, Tex., assignor to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Nov. 10, 1971, Ser. No. 197,403
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **15 Claims**



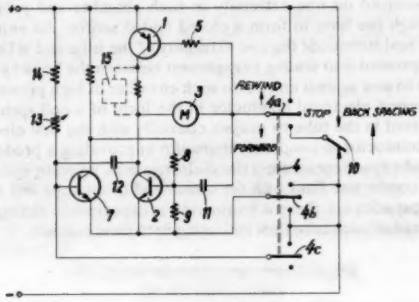
An A.C. motor speed control circuit is disclosed in which a three-phase A.C. input signal is converted to a D.C. link voltage by a controlled rectifier bridge and filter. The D.C. link voltage is converted back to a three-phase output voltage, of controllable frequency, by a three-phase switching bridge inverter. The amplitude of the link voltage provided by the controlled rectifier bridge and filter is controlled by a control signal which also sets the frequency of the three-phase output signal provided by the switching bridge inverter. This insures that the amplitude versus frequency characteristic of the three-phase A.C. output is relatively linear. A slow acting current limiting circuit monitors the output current of the switching bridge inverter. A fast acting current limiting circuit monitors the integral of the D.C. link voltage over preselected time intervals to adjust the frequency of operation of the switching bridge if the integral exceeds a threshold value.

3,748,557

CIRCUIT FOR SHORT REVERSE OPERATION OF A MOTOR IN A DICTATING MACHINE OR THE LIKE

Rainer Mittelstaedt, Nuernberg, Germany, assignor to Grundig E.M.V, Furth/Bay, Germany

Filed July 19, 1972, Ser. No. 273,178
Claims priority, application Germany, Dec. 31, 1971, P 21 65 860.6
Int. Cl. H02p *1/22*
U.S. Cl. 318—256 **3 Claims**



A motor control circuit is shown having two transistors of opposite conductivity type connected in series between power supply terminals and with the motor connected between a switch and the common terminal of the transistors. The switch can be connected to either the positive or negative power supply terminals. An additional transistor is connected in a monostable multivibrator circuit with the transistor that is conductive during reverse operation of the motor. An additional switch connects a pulse to the monostable multivibrator when the main switch is set for forward rotation of the motor. This pulse puts the multivibrator into its unstable state to reverse current through the motor until the multivibrator returns to its stable state.

3,748,558

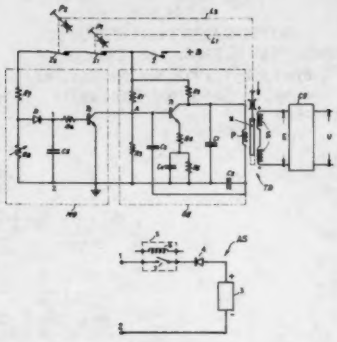
ELECTRONIC POSITION TRANSDUCER FOR CONTROL MEMBERS

Vito Tateo, Milano, and Guido Galli, Bastiglia (Modena), both of Italy, assignors to Fabrica Italiana Magnet Marelli S.p.A., Milano, Italy

Filed Nov. 30, 1971, Ser. No. 203,361
Claims priority, application Italy, Dec. 5, 1970, 32715 A/70
Int. Cl. H02p *5/18*
U.S. Cl. 318—341 **5 Claims**

A control circuit which eliminates the need for wiping contacts normally employed in conjunction with traction motors for use in operating vehicles. Forward or reverse operation of the traction motor (and hence the vehicle) is controlled by a plunger movable with the vehicle foot pedal. An oscillating circuit develops an output whose rate controls the speed of the traction motor. The output rate of the circuit, in turn, is controlled by any circuit having a storage member which alterna-

tively either charges or discharges according to its electrical connection so as to cause the oscillating circuit to reach the



final selected frequency in a gradual manner. A braking circuit is also provided for gradually braking the traction motor.

3,748,559

SPEED CONTROL ARRANGEMENT FOR DC MOTORS

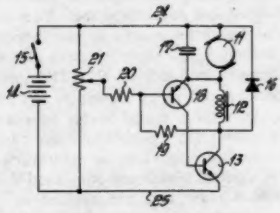
Helmut Steinmann, Baden-Baden, Germany, assignor to Robert Bosch G.m.b.H., Stuggart, Germany

Filed Jan. 31, 1972, Ser. No. 222,219

Claims priority, application Germany, Feb. 3, 1971, P 21 04 895.3

Int. Cl. H02p *5/16*

U.S. Cl. 318—341 **14 Claims**



An arrangement for controlling the speeds of DC motors, in which a first transistor is connected in series with the motor and supplies current for driving the motor. The operational state of the first transistor is controlled by a second complementary transistor. An adjustable resistor sets the base current for the second controlling transistor. The two transistors form a switching circuit in conjunction with a feedback resistor, so that switching takes place as a function of the voltage appearing across a capacitor connected in parallel with the motor. Inductance between the motor and the first transistor functions together with the capacitor as a smoothing circuit.

3,748,560

DEVICE INCLUDING THYRISTOR CHOPPER FOR CONTROLLING INDUCTIVE LOAD

Kunihiko Sawa; Shigenori Kinoshita, and Masahiro Kaimoto, all of Kawasaki-shi, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan

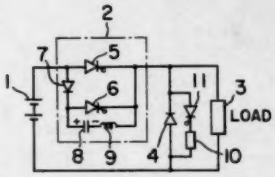
Filed July 14, 1972, Ser. No. 271,728

Claims priority, application Japan, July 14, 1971, 46/52327; July 4, 1971, 46/52328

Int. Cl. H02p *3/14*

U.S. Cl. 318—430 **3 Claims**

A control device including a thyristor chopper for controlling an inductive load such as a d.c. motor comprises a chopper including a main thyristor and means for extingushing the main thyristor, the chopper being connected in series or in parallel to a d.c. power source, a free-wheeling diode or a normal current blocking diode, either of which is of a polarity opposite to that of the d.c. power source and is connected in parallel or in series to the inductive load, and an auxiliary circuit comprising a resistor and a second thyristor connected in series and further connected in parallel to the free-wheeling



diode or normal current blocking diode, the second thyristor having a polarity reverse to that of the diode, and receiving, at least in the starting period of the controlling operation, an ignition pulse in synchronism with the ignition pulse applied to the main thyristor, and the resistance value of the resistor being so selected that the current flowing through the main thyristor is greater than a latching current of the main thyristor.

3,748,561

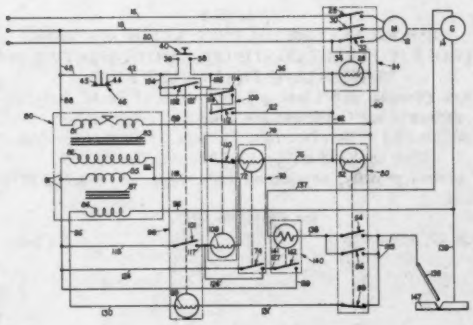
REMOTE STARTING CONTROL CIRCUIT FOR WELDER POWER SUPPLY

Burton M. Williams, Eugene, Oreg., assignor to Fibreboard Corporation, San Francisco, Calif.

Filed Oct. 6, 1971, Ser. No. 186,853

Int. Cl. H02r *1/04*

U.S. Cl. 318—484 **7 Claims**

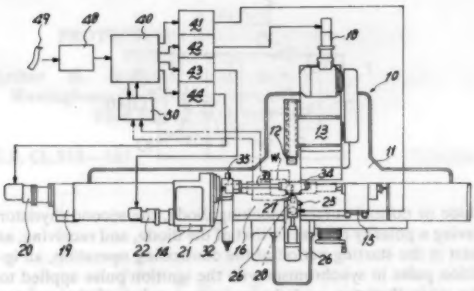


A control circuit for remote starting of an AC motor coupled to a DC generator used to supply a welding load circuit. A low voltage switching circuit connected across the load circuit starts the motor upon contact between the welding rod and workpiece and is then reset. The low voltage switching circuit automatically sets a timer which maintains the motor on for a predetermined time. Another circuit sensitive to DC current in the load circuit and resets the timer each time a welding arc is struck. If the timer times out and cuts off the motor before an arc is struck the motor can be restarted by contact between the rod and workpiece. Manual starting means is provided which also sets the timer.

3,748,562
FEED CONTROL APPARATUS HAVING A GAUGING DEVICE FOR A NUMERICALLY CONTROLLED MACHINE TOOL

Hiroyasu Takegawa, and Shiro Seki, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan

Claims priority, application Japan, July 18, 1970, 45/63079
Int. Cl. G05b *19/24*
U.S. Cl. 318—572 **8 Claims**

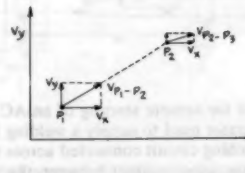


In a numerically controlled machine tool a feed control apparatus is provided which includes a gauging means for controlling the movement of a movable component, such as a wheel head or a work table, of the machine tool. Control means are coupled to a numerical control means of the numerically controlled machine tool and to the gauging means. The control means will enable a shifting of the numerical control means from a numerical control mode to a jog mode for allowing a miscellaneous function to be performed and from a jog mode to a numerical control mode after a sizing signal is generated by the gauging means whereby the tool is first moved in a coarse numerical mode to a preset position, then the workpiece is gauged while the system is in the jog mode, and finally switched back to a fine numerical control for final machining with a resultant saving in the amount of numerical information required.

3,748,563
NUMERICAL CONTROL DEVICES FOR MACHINE TOOLS TO PERMIT CONTINUOUS MOTION BETWEEN SEGMENTS OF THE DESIRED PATH

Piero Pomella, and Luciano Lauro, both of Turin, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy

Continuation of Ser. No. 760,523, Sept. 18, 1968, abandoned.
This application Nov. 12, 1970, Ser. No. 88,979
Claims priority, application Italy, Sept. 19, 1967, 53075 A/67
Int. Cl. G05b *19/24*
U.S. Cl. 318—573 **5 Claims**

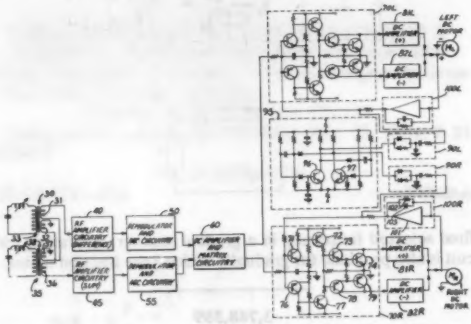


A numerical control device for such as machine tool operation, in which position and speed of movement of the tool or the workpiece is automatically effected in accordance with a preset program and certain recorded preselected information. The control provides for movement along a segment of the desired path generally in three phases: 1) acceleration to a predetermined maximum speed; 2) constant speed, and, 3) deceleration to zero speed. However, provision is also made for continuous movement along adjacent path segments through elimination of the third phase of the first segment.

3,748,564
MOTOR CONTROL CIRCUIT

Shunjiro Ohba, 5969 N. Elston Ave., Chicago, Ill.

Filed July 7, 1972, Ser. No. 269,743
Int. Cl. G05d *1/00*; B64c *16/18*
U.S. Cl. 318—587 **6 Claims**

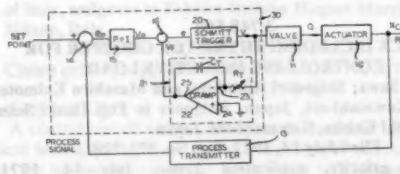


A remote-controlled vehicle has left and right driving wheels independently propelled by a pair of DC electric motors, with the vehicle being responsive to a control signal transmitted by a portable transmitter carried by a moving individual for transporting a load at a predetermined distance behind said individual. The vehicle has an improved electronic control system comprising a receiver for receiving the transmitted control signal and developing therefrom a range signal representative of the distance between the individual and the vehicle and a bearing signal representative of the heading of the vehicle relative to said individual. A DC amplifier circuit converts the bearing and range signals to left and right DC control signals. An astable multivibrator generates a pair of fixed-frequency pulse-train signals which are each converted to trapezoidal pulse-train signals by an integrating circuit. The left and right DC control signals are combined with the trapezoidal pulse-train signals and are applied to a threshold switching circuit which develops a variable-width rectangular pulse-train signal which is applied to the motor.

3,748,565
PREDICTIVE POSITION FEEDBACK CONTROLLER FOR WEB GUIDE CONTROL SYSTEM

Francis B. Wilson, Wauconda, and Mathew E. Rodenkirch, Chicago, both of Ill., assignors to The Singer Company, New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,677
Int. Cl. G05b *11/36*
U.S. Cl. 318—609 **13 Claims**

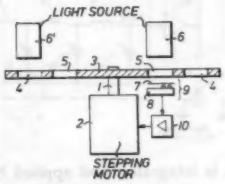


An electronic controller for a process control system for use with a bi-directional single speed actuating device wherein the controller includes a proportional plus integral mode with predictive position feedback.

3,748,566
STEPPING MOTOR WITH COMPENSATED ANGULAR ERROR

Peter Brembs, Heusenstamm, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Feb. 25, 1971, Ser. No. 118,643
Claims priority, application Germany, Feb. 28, 1970, P 20 09 558.3
Int. Cl. G05b *19/40*
U.S. Cl. 318—685 8 Claims

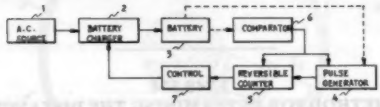


Compensation for the angular error of an electric stepping motor is provided by generating an electrical error signal whenever the rotor of the stepping motor deviates from a selected stepping position and then utilizing this error signal to correct or adjust the individual winding currents being supplied to the motor to cause the rotor to correctly position itself at the selected stepping position. The error signal is preferably derived, e.g., optically, from a pair of control tracks which are scanned and the signals combined to form a difference signal. The difference signal is in turn applied to switching amplifiers, which are digitally controlled between their on and off positions to selectively provide the winding currents for the motor to cause the rotor thereof to move to a selected stepping position, so as to correct the output current of the switching amplifier to compensate for the angular error.

3,748,567
STORAGE BATTERY CHARGING DEVICE

Hiroshi Arai, Osaka; Yoshiaki Komuro, Nishinomiya, and Akinari Kasai, Osaka, all of Japan, assignors to Sansha Electric Manufacturing Company Limited, Osaka, Japan

Filed Oct. 19, 1972, Ser. No. 299,057
Claims priority, application Japan, Nov. 29, 1971, 46/96544
Int. Cl. H02j *7/04*
U.S. Cl. 320—22 3 Claims



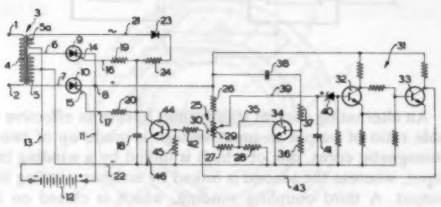
A battery charger having means for measuring the quantity of energy imparted to a battery before the reversing point of the charge at which there is a sudden, step-like change in voltage, and then imparting a quantity of energy to the battery which constitutes a selected proportion of the energy imparted before the reversing point.

The means for measuring the quantity of energy imparted comprise a variable frequency pulse generator and a reversible counter with the step-like change in voltage changing the frequency of the pulse generator and changing the mode of operation of the reversible counter from addition to subtraction; the charging operation is interrupted when the counter has counted down to zero.

3,748,568
AUTOMATICALLY TERMINATING BATTERY CHARGING ARRANGEMENT WITH MEANS FOR DECREASING RIPPLE EFFECT

Karl Ackermann, Berlin, Germany, assignor to Robert Bosch Photokino GmbH, Stuggart, Germany

Filed Apr. 18, 1972, Ser. No. 245,097
Claims priority, application Germany, Apr. 28, 1971, P 21 20 798.7
Int. Cl. H02j *7/10*
U.S. Cl. 320—31 11 Claims

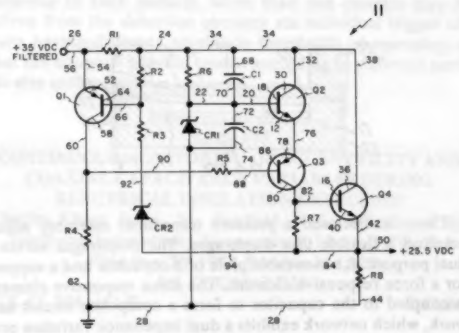


Charging of a battery from an A.C. source through a controlled rectifier is terminated when a voltage varying directly with the battery output voltage and inversely with A.C. ripple on the battery output voltage has reached a predetermined amplitude.

3,748,569
REGULATED SHORT CIRCUIT PROTECTED POWER SUPPLY

Gilbert Haven Frank, Columbia, and John L. Thomas, Reisterstown, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 13, 1972, Ser. No. 243,710
Int. Cl. G05f *1/58*
U.S. Cl. 323—9 2 Claims



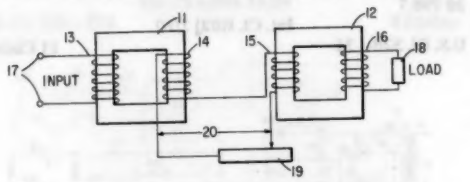
A voltage regulated power supply utilizing a small series resistance to sense load current and a circuit including a normally "off" trigger transistor having its base connected to the load side of the series resistor for actuation to "on" condition responsive to voltage drop in the resistor and a series switching transistor having its base connected to the output of the trigger transistor to shut off the series switching transistor in an overload condition which in turn interrupts operation of a series transistor by interrupting base current thereto. The circuit also includes a latching zener diode connected to the base of the trigger transistor to maintain its "on" condition after overload to maintain the power supply inoperative until the fault is removed and the supply is recycled.

3,748,570

ADJUSTABLE OUTPUT VOLTAGE TRANSFORMER

Samuel T. Martner, Tulsa, Okla., assignor to Amco Production Company, Tulsa, Okla.

Filed June 26, 1972, Ser. No. 266,185
Int. Cl. H01f 39/00
U.S. Cl. 323—44 R 5 Claims



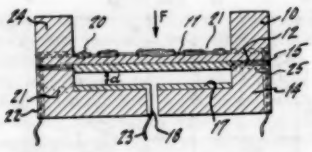
An alternating current transformer having an effective variable ratio of output to input voltage is made up of two ferromagnetic cores, one of which is linked by a winding to the input, whereas the second is linked by another winding to the output. A third coupling winding, which is closed on itself through an adjustable impedance, electromagnetically links the two cores. When the impedance in the coupling winding is low, the voltage ratio of the arrangement is essentially the turns ratio of the output to the input windings; when the adjustable impedance is high, the coupling between the two cores is weak and the output voltage is much below its maximum possible value. There is no need for voltage adjustment by other means such as, for example, magnetic saturation of the cores through the interposition of a direct current on one of the windings.

3,748,571

PRESSURE SENSITIVE TRANSDUCERS EMPLOYING CAPACITIVE AND RESISTIVE VARIATIONS

Anthony D. Kurtz, Englewood, N.J., assignor to Kulite Semiconductors Products, Inc., Ridgefield, N.J.

Filed Sept. 7, 1972, Ser. No. 287,059
Int. Cl. G05f 3/00
U.S. Cl. 323—74 10 Claims



There is disclosed a pressure transducer assembly which employs a flexible thin diaphragm. The diaphragm serves a dual purpose as a moveable plate of a capacitor and a support for a force responsive element. The force responsive element is coupled to the capacitor to form a composite circuit network, which network exhibits a dual impedance variation proportional to diaphragm deflection.

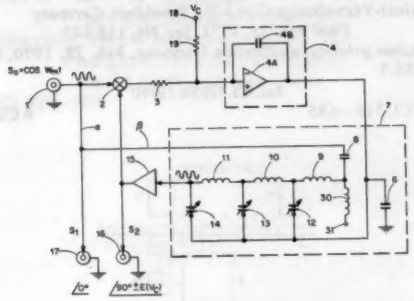
3,748,572

WIDE FREQUENCY RANGE PHASE SHIFTER DEVICE

Kap S. Kim, and Thomas V. Saliga, both of Clearwater, Fla., assignors to Honeywell Information Inc., Waltham, Mass.

Filed May 4, 1972, Ser. No. 250,265
Int. Cl. G05f 1/68
U.S. Cl. 323—106 11 Claims

A wide frequency range phase shifter for shifting phase of an ac signal by a predetermined amount with less than one degree phase error over substantially a five to one frequency range. A phase detector compares the phase of an input signal with the phase of the input signal that has been shifted by a predetermined amount and provides an output signal which is a measure of the phase difference between the two inputs. The



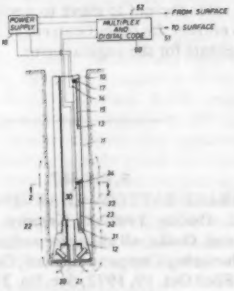
resulting signal is integrated and applied back to a voltage controlled phase shifter in such a direction so as to correct any error in the amount of the predetermined delay.

3,748,573

ELECTRICAL LOGGING SYSTEM FOR USE WITH A DRILL STRING

Charles B. Vogel, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed June 21, 1971, Ser. No. 155,028
Int. Cl. G01v 3/06, 3/18
U.S. Cl. 324—10 5 Claims



An electrical logging system adapted for installation on a drill string for use while drilling. The system includes a specific electrode arrangement that will operate in the vicinity of ferromagnetic drill strings. The electrode arrangement may also be used with more conventional wireline resistivity logging systems.

3,748,574

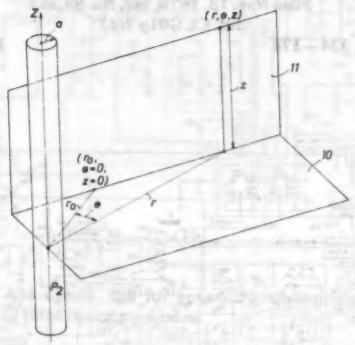
METHOD FOR DETERMINING THE DISTANCE BETWEEN A CASED AND AN OPEN WELL

Forrest R. Mitchell, Metairie, La., and John P. Vogiatzis, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 27, 1972, Ser. No. 221,368
Int. Cl. G01v 3/18
U.S. Cl. 324—1 8 Claims

A method for determining the distance between a cased well and an open well using resistivity measurements made in the open well using long electrode spacings and a resistivity is calculated from data that is not influenced by the casing in the cased well. A calculation is made of the anticipated reduction in the resistivity measurements caused by the presence of the casing using the calculated resistivity and assuming varying

distances between the cased well and the point at which the resistivity is measured. A nomograph is prepared by plotting the calculated reduction versus the assumed distances for each calculated formation resistivity. The measured resistivity



is used to determine the actual reduction in the resistivity caused by the casing and the distance between the two wells is then obtained from the nomograph.

3,748,575

APPARATUS FOR TESTING MAGNETIC CHARACTERISTICS OF A MOVING METAL STRIP UTILIZING A ROLLER CONTAINING A FIXED NONROTATABLE MONITOR IN CONTACT WITH THE STRIP

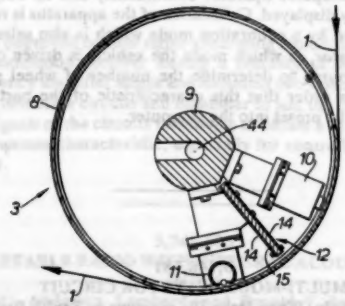
Maurice Noel Lapper, Llanelli, Carmarthen, Wales, assignor to British Steel Corporation, London, England

Filed June 18, 1971, Ser. No. 154,391

Claims priority, application Great Britain, June 19, 1970, 29,928/70

Int. Cl. G01r *33/12*

U.S. Cl. 324—34 R 6 Claims



A apparatus for of testing a magnetic characteristic of a metal strip in which the strip is passed under tension over part of the external surface of a hollow cylindrical member, and a magnetic characteristic of the strip is monitored by means of magnetic monitoring device located within said hollow member at a predetermined fixed position relative to the said external surface of the hollow member.

3,748,576

DETECTION OF PARTICLE-INCLUSIONS IN FLUID FLOW UTILIZING A DIVIDED FLUID PATH WITH A SENSING COIL ABOUT EACH PATH

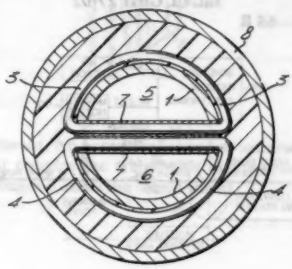
Norman Lomas Sigournay, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Filed Feb. 25, 1971, Ser. No. 118,887

Claims priority, application Great Britain, Feb. 27, 1970, 9,492/70; Apr. 21, 1970, 19,134/70

Int. Cl. G01r *33/00*

U.S. Cl. 324—41 13 Claims



Detector apparatus for detecting and counting particles flowing in an engine oil-return line includes two electrical coils connected in different arms of an alternating-current bridge to have opposite unbalancing effects on the bridge in response to coil-impedance changes. The coils embrace different ones of two sub-paths into which the oil flow is divided, and detection circuitry that drives a counter is connected to the bridge to sense the condition in which there is a transitory change in impedance of either coil unaccompanied by corresponding change in the other, so as thereby to discriminate against inclusions in the oil, other than particles, that divide between the two sub-paths. The detection circuitry includes filtering to eliminate counting of signals arising from vibrations and long-term unbalance of the bridge, and two further coils embracing the two sub-paths respectively may be connected in the bridge to ensure generation of bipolar signals in response to each particle. More than one counter may be driven from the detection circuitry via individual trigger circuits having different amplitude thresholds of operation so that the counters provide counts according to different particle-size categories.

3,748,577

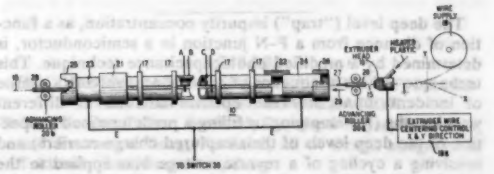
CONTINUOUS MONITORING OF ECCENTRICITY AND COAXIAL CAPACITANCE VARIABLES DURING ELECTRICAL INSULATION EXTRUSION

Charles Elmer Jones, Jr., Fairfield, N.Y., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1971, Ser. No. 214,329

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R 7 Claims



A system for monitoring telephone cable insulation and jacket wall thickness and centering during manufacture consists of four capacitive probe segments spaced at 90° intervals with a dielectric gap separating adjacent segments. The probe

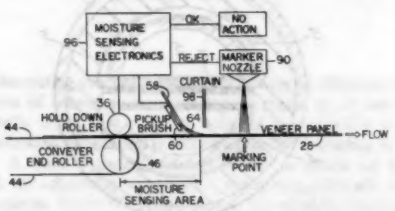
is flanked by guard tubes which along with each segment are connected to a switch capable of placing any or all segments at guard potential. In various configurations ordered by the switch, capacitance measurements are made to yield indicia of coaxial capacitance, eccentricity and ovality.

3,748,578

WOOD VENEER MOISTURE DETECTION EQUIPMENT LOCATED ON A PRODUCTION LINE

Donald D. Ward, P. O. Box K., Sumner, Wash.

Filed Oct. 13, 1971, Ser. No. 188,931
Int. Cl. G01r 27/02
U.S. Cl. 324—65 R **27 Claims**



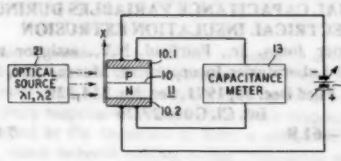
Improvements in on-line wood veneer moisture detection equipment involve closer and protective positioning of wire brush electrical sensors and very efficient utilization of fewer conveyor components. These improvements insure only one transverse moisture sensing zone will be created, initiating in turn only one signal from each respective portion of a wood veneer having a designated excessive moisture content. The signal is used to actuate an ink marker, and the excessive moisture is located and eliminated to subsequently avoid any formation of blows and/or blisters during subsequent hot press operations. Also the signal is used for directly and indirectly controling the speed of the dryer in a closed loop system.

3,748,579

METHOD FOR DETERMINING CONCENTRATION PROFILES OF DEEP LEVELS ON BOTH SIDES OF A P-N JUNCTION

Charles Howard Henry, New Providence, and Hiroshi Kukimoto, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1971, Ser. No. 198,321
Int. Cl. G01r 31/22, 27/26
U.S. Cl. 324—158 D **10 Claims**



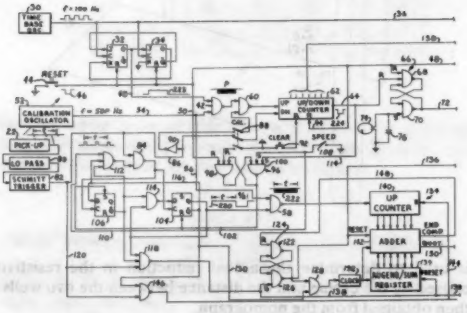
The deep level ("trap") impurity concentration, as a function of distance from a P–N junction in a semiconductor, is determined by a modified photocapacitance technique. This technique utilizes a sequence of operations involving a source of incident monochromatic optical radiation of different wavelengths (for emptying or filling a predetermined proportion of the deep levels of their captured charge carriers) and involving a cycling of a reverse voltage bias applied to the junction. The difference in electrical capacitance of the junction as measured before and after the optical irradiation of the junction, as a function of reverse voltage bias, is a measure of the concentration of deep levels as a function of distance from the P–N junction. The deep level concentration on both the P and the N side of the junction can thereby be determined.

3,748,580

ELAPSED TIME AND TERMINAL SPEED COMPUTER FOR AUTOMOTIVE VEHICLES

Harry S. Stevens, Kansas City; Jerry W. Karr, Pleasant Hill; Dennis D. Miller, Buckner, and Forrest H. Ballinger, Grain Valley, all of Mo., assignors to Harmon Electronics, Inc., Grain Valley, Mo.

Filed Nov. 13, 1970, Ser. No. 89,263
Int. Cl. G01p 3/42
U.S. Cl. 324—178 **12 Claims**



A speed and elapsed time computer has a digital display in view of the driver of an automotive vehicle. A row of selector switches permits the driver to select one of several modes of operation, including "speedometer," "terminal speed," and "elapsed time." A magnetic pickup senses the rotation of an undriven wheel, and wheel pulses are produced in response to the sensed rotation. In the elapsed time mode, timing signals from a time base oscillator are counted from the time the vehicle leaves a standing start until a number of wheel pulses have been produced corresponding to a predetermined distance, such as a quarter mile. At the end of the run, the elapsed time is displayed; the driver may then operate the terminal speed switch and the speed reached at the end of the quarter is displayed. Speed is computed from the period of a wheel revolution obtained from the wheel pulses, and from the number of pulses produced by the vehicle in traversing a given distance, which may also be a quarter mile. In the speedometer mode, the speed computer operates continuously and its output is continuously displayed. Calibration of the apparatus is readily accomplished by a calibration mode which is also selectable by the operator, in which mode the vehicle is driven over a measured course to determine the number of wheel pulses produced, in order that this characteristic of the particular vehicle may be preset into the computer.

3,748,581

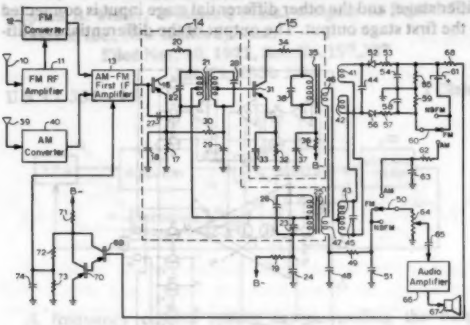
MULTI-MODE DETECTOR CIRCUIT

Joseph F. Yello, Wood Dale, Ill., assignor to Zenith Radio orporation, Chicago, Ill.

Filed Dec. 13, 1971, Ser. No. 207,207
Int. Cl. H04b 1/06
U.S. Cl. 325—317 **9 Claims**

A multi-band wave-signal receiver incorporates a novel detector circuit for demodulating AM, FM and NBFM signals at two widely divergent IF frequencies. The detector employs a novel split-winding resonant input circuit which allows FM signals at 10.7 MHz and NBFM signals at 455 kHz to be al-

ternately demodulated by a single ratio detector without band-switching the input circuit. Provision is made for disconnecting the ratio detector filter capacitor to permit detection of



455 kHz AM signals, and for generating appropriate AGC signals in all three operating modes.

3,748,582

CONTROL SIGNAL GENERATING CIRCUIT FOR SHARP FREQUENCY RESPONSE TUNING

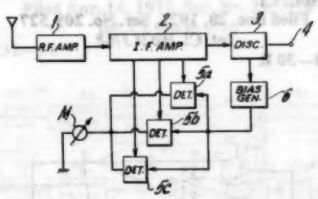
Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 142,827, May 15, 1970. This application Oct. 6, 1971, Ser. No. 187,013

Claims priority, application Japan, May 15, 1970, 45/4184770; Oct. 8, 1970, 45/8861470

Int. Cl. H04b *1/06*

U.S. Cl. 325—344 **6 Claims**



An improved control signal generating circuit for a frequency modulation receiver having a plurality of intermediate-frequency amplifier stages and including two relatively narrow band detection circuits and combiner to add the detected output signals of the circuits selectively to obtain a sharp frequency response characteristic, especially for controlling a tuning meter.

3,748,583

PORTABLE RADIO WITH INTEGRAL ACOUSTICAL HORN

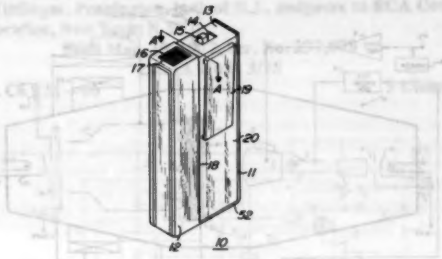
Todd G. Andersen, Lombard, and Donald Y. Ing, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 10, 1972, Ser. No. 216,674

Int. Cl. H04b *1/08*

U.S. Cl. 325—353 **6 Claims**

A portable radio receiver having a rectangular elongated housing with a first rectangular elongated compartment, and a second rectangular elongated compartment adjacent the first compartment. An interior partition wall separates the two compartments. The second compartment has a passage therein which forms an acoustical horn. A removable radio receiver chassis including a transducer device is seated in the



first compartment. An acoustical chamber secured in the first compartment couples the transducer to the acoustical horn which amplifies and emits the sound waves.

3,748,584

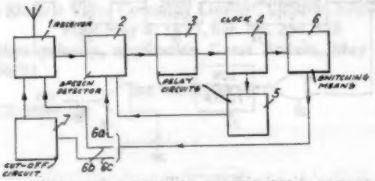
APPARATUS FOR FEEDING A SINGLE SIDEBAND RECEIVER

Jean Louis Ribour, La Celle St. Cloud, and Michel Georges Poullain, Arcueil, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 9, 1971, Ser. No. 113,910

Int. Cl. H04b *1/16*

U.S. Cl. 325—492 **6 Claims**



A control device is provided for supplying power to a SSB receiver during a watching period. During periods between transmissions, receiver power controlled by means of a clock is supplied alternatively at normal and reduced levels. A device for detection of speech signals allows the search for transmissions during the normal power supply periods. If the search detects transmissions, normal power supply is kept; if search fails, power supply is reduced at the end of the concerned period.

3,748,585

SILICON DIODE ARRAY SCAN CONVERTER STORAGE TUBE AND METHOD OF OPERATION

Robert Gordon Culter, Portland; Raymond Hayes, Beaverton, and Emmanuel Sang, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

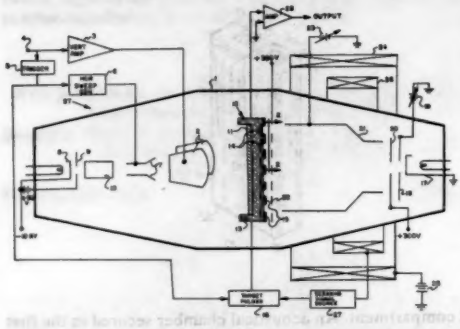
Filed Nov. 15, 1971, Ser. No. 198,582

Int. Cl. G11c *11/26, 11/34*

U.S. Cl. 328—124 **12 Claims**

A silicon diode array scan converter storage tube is disclosed which, after a diode array target has been electrically prepared, has information written on the diode array target in

a writing mode, the information is transferred to an oxide coating of the target to store same, and the target is subjected



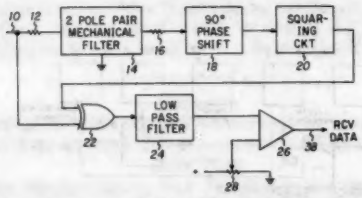
to a scanning mode while being illuminated, thereby producing an electrical readout signal corresponding to the stored information thereon.

3,748,586

FREQUENCY DISCRIMINATOR UTILIZING MECHANICAL FILTER

Robert A. Johnson, Tustin, and Theodore M. Stump, Costa Mesa, both of Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed May 2, 1972, Ser. No. 249,580
Int. Cl. H03d 3/02
U.S. Cl. 329—104 **3 Claims**



A frequency discriminator utilizing a frequency sensitive phase shifting means, a two input gate, means for applying an fm signal to the phase shifting means and to a gate input, means applying the output of the phase shifting means to a gate input, the gate producing an output signal dependent on coincidence of the input signals. The phase responsive means may comprise a mechanical filter having symmetrical and essentially linear phase versus frequency response.

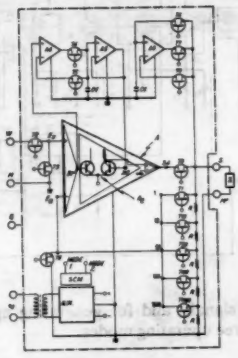
3,748,587

CONTINUOUS AMPLIFIER ASSEMBLY WITH DRIFT CORRECTION

Michel Aumiaux, Nantes, France, assignor to Societe D'Etudes, Recherches Et Constructions Electroniques S.E.R.C.E.L., Atlantique, France

Continuation of Ser. No. 7,071, Jan. 30, 1970. This application Apr. 21, 1972, Ser. No. 246,494
Claims priority, application France, May 21, 1969, 6916512
Int. Cl. H03f 1/02
U.S. Cl. 330—9 **6 Claims**

An amplifier assembly for amplifying weak DC signals and having means for drift correction. The assembly includes commutating devices for causing it to operate cyclicly in two distinct operating modes, alternately of short and long duration. In the short sampling modes when the assembly input is zero, the drift of a first amplifier stage is sampled and stored in a memory and the assembly output is disconnected from the load. During the longer alternate modes when the DC input is applied to the first amplifier stage, the assembly output is connected to the load, the previously stored signal is supplied as a drift correction signal to one input of a differential input amplifier stage, and the other differential stage input is connected to the first stage output. The output of the differential amplifi-



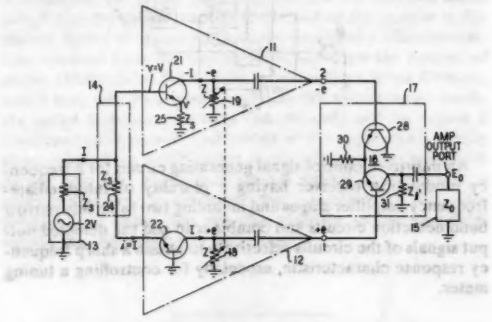
er stage yields the final output from the assembly; when such output is disconnected from the load during the short sampling modes, the value thereof is maintained across the load from a second memory charged from the assembly output during the previous longer mode.

3,748,588

IMPEDANCE-MATCHED AMPLIFIERS

Henry Richard Beurrier, Chester Township, County of Morris, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1971, Ser. No. 209,527
Int. Cl. H03f 3/68
U.S. Cl. 330—30 R **4 Claims**

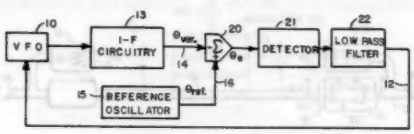


This application describes a class of amplifiers comprising two active stages having mutually inverse input impedances coupled to a common source by means of an impedance-matching input circuit, and to a common output load by means of an output circuit. In previously described amplifiers, of a related class, the required signal balance at the output of the active stages was produced by the output coupling circuit. In the amplifiers described herein, this signal balance is obtained by means associated with one or the other of the active stages. By relieving the output circuit of this function, a greater variety of output circuits is possible.

3,748,589
SYSTEM FOR CONTROLLING A VARIABLE FREQUENCY OSCILLATOR BY DIGITAL PHASE COMPARISON MEANS

Stephen B. Miller, Westport, Mass., assignor to Bristol Electronics, Inc., New Bedford, Mass.

Filed Nov. 10, 1971, Ser. No. 197,387
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A 2 Claims

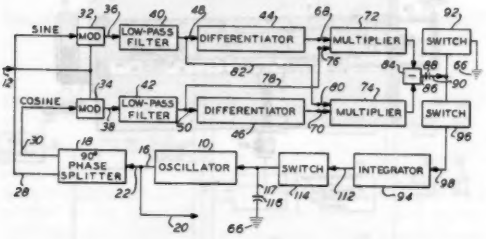


A frequency control system for controlling the output frequency of a variable frequency oscillator in accordance with a reference oscillator wherein the variable frequency oscillator and reference frequency oscillator signals are converted to pulsed form and their phases are compared to provide a phase difference signal in digital form. The phase difference signal is converted to analog form and filtered by a low-pass filter having a selected transfer characteristic to provide a phase control signal for controlling the operation of the variable frequency oscillator. The control system for producing the phase control signal can be formed as a single module unit using presently available integrated circuit chips for certain portions thereof and suitable external circuit elements in combination therewith.

3,748,590
SINE COSINE FREQUENCY TRACKER

John W. Gray, Guilford, Conn., assignor to The Singer Company, Little Falls, N.J.

Filed Apr. 14, 1972, Ser. No. 243,970
Int. Cl. H03b 3/10
U.S. Cl. 331—12 9 Claims

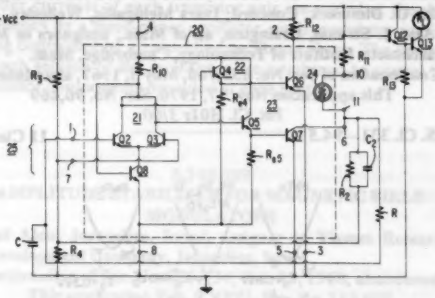


A frequency tracker in which the input frequency to be tracked is first heterodyned by a pair of signals, in phase quadrature, at a first reference frequency thereby producing a pair of filtered signals, in phase quadrature, proportional to the difference in frequency between the input and reference frequency. The time derivative is taken of each of these filtered signals. The outputs of each of the differentiators are multiplied together with the filtered output of the opposite channel, with the multiplied outputs combined to form a signal proportional to the input power and the difference in frequency between the input and reference frequency. The combined outputs are integrated to provide an error signal, proportional to the frequency difference, which is periodically applied to the reference frequency oscillator to adjust its frequency so that it is more closely aligned with the input frequency.

3,748,591
ILLUMINATION ACTIVATED TRANSISTOR RELAXATION OSCILLATOR

Armando Joseph Visioli, Jr., Dover, and Harold Allen Wittlinger, Pennington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,079
Int. Cl. H03k 3/28
U.S. Cl. 331—66 5 Claims

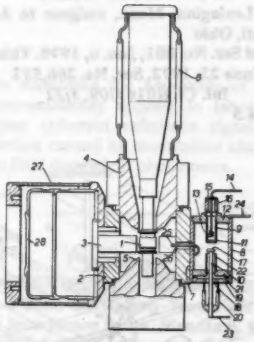


An illumination activated circuit for supplying power from an oscillatory source to a load. A light sensitive device is arranged in the output circuit of the source such that the signal provided by the source to the load is initiated only when illumination above a certain intensity is received by the device, the device being in effect a dynamic load for the source.

3,748,592
MAGNETRON OSCILLATORS

Alan Hugh Pickering, Springfield, England, assignor to English Electric Valve Company Limited, London, England

Filed May 4, 1972, Ser. No. 250,358
Claims priority, application Great Britain, May 4, 1971, 13,036/71
Int. Cl. H03b 9/10
U.S. Cl. 331—90 8 Claims



A magnetron oscillator having the normally provided cavities of a magnetron oscillator, has a further resonant cavity coupled to one of the normally provided cavities by an inductive loop. The further cavity is provided with two electrodes facing one another, the opposing faces being coated with a secondary electron emissive material. The two electrodes are spaced apart such that an electron released from one surface takes a time equal to half a cycle of the R.F. voltage developed between the two electrodes to cross the gap to the other electrode thereby producing a multipactor discharge between the

two electrodes. While multipactor discharging occurs the further cavity is effectively short circuited so that the magnetron frequency of oscillation is the resonant frequency of its anode cathode resonator. The multipactor discharge is stopped by application of a D.C. voltage to the two electrodes so that the further cavity pulls the magnetron frequency.

3,748,593

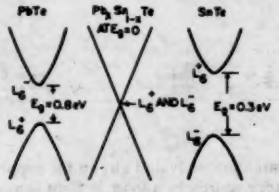
METHOD AND MEANS OF CONSTRUCTION OF A SEMICONDUCTOR MATERIAL FOR USE AS A LASER

John O. Dimmock, Concord; Ivars Melngailis, Wellesley, and Alan J. Strauss, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 635,766, May 3, 1967, abandoned. This application Nov. 17, 1970, Ser. No. 90,469

Int. Cl. H01r 3/00

U.S. Cl. 331—94.5 H **11 Claims**



A semiconductor material for use as a lasing medium made of a solid solution of at least two Group IV– VI compounds which form a semiconductor alloy having a direct band gap which is increased or decreased, depending on the proportion of said materials in the solid solution, there being a certain proportion at which the band gap is zero, at a given temperature and pressure, whereas greater or lesser proportions than said certain proportion results in an increase in the band gap of the semiconductor from said zero band gap.

3,748,594

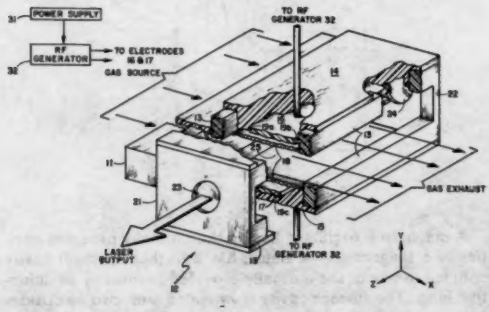
RADIO FREQUENCY ELECTRICALLY EXCITED FLOWING GAS LASER

Evan R. Pugh, Lexington, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Continuation of Ser. No. 881, Jan. 6, 1970. This application June 22, 1972, Ser. No. 266,512

Int. Cl. H01s 3/09, 3/22

U.S. Cl. 331—94.5 **4 Claims**



Apparatus for producing laser action in a flowing gas by electromagnetic energy at radio frequencies wherein the discharge circuit is capacitively ballasted by providing capacitive impedance between the electrode and the gas.

3,748,595

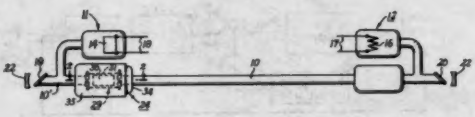
HELIUM-CADMIUM LASER AND METHOD FOR OPTIMUM OPERATION

Jameson Dane Rigden, Westport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 6, 1970, Ser. No. 17,212

Int. Cl. H01s 3/22

U.S. Cl. 331—94.5 **5 Claims**



Means for introducing cadmium vapor into a helium laser tube and for maintaining optimum vapor pressure are disclosed in the form of a steel jacketed hollow cadmium cylinder mounted coaxially within the laser tube between the anode and cathode, and surrounded by an evacuated bulb. Plasma discharge of the ionized helium gas passes through and heats the hollow cadmium cylinder to produce cadmium vapor, thus eliminating any need for an auxiliary heater. A method of selecting and adjusting the plasma discharge current to optimum value is also disclosed.

3,748,596

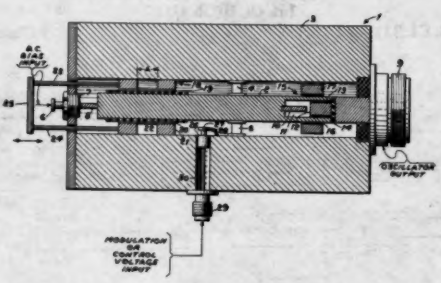
MULTIPLE DIODE COAXIAL CAVITY OSCILLATOR WITH MANUAL AND VARACTOR DIODE TUNING

Allan L. Reynolds, White Plains, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 14, 1972, Ser. No. 234,583

Int. Cl. H03b 7/14

U.S. Cl. 331—101 **10 Claims**

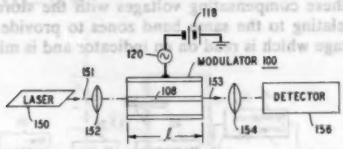


A novel coaxial line cavity oscillator is disclosed which enables the oscillation outputs of two or more Gunn or Impatt diodes to be efficiently combined over relatively broad radio frequency ranges. The two or more diodes are directly connected between the inner and outer conductors of the coaxial line cavity. Continuous frequency tuning is accomplished by mechanically adjusting a capacitive sliding shorting arrangement disposed between the inner and outer conductor of the coaxial line cavity. A varactor diode tuning arrangement is also provided where the varactor diode is disposed to be coupled into the coaxial cavity between the two or more Gunn or Impatt diodes and the mechanical capacitive sliding shorting arrangement. This frequency tuning arrangement is free from breakup, mode jumping, skipping, hysteresis effects or any other type of tuning irregularity ususally encountered when the oscillation outputs of two or more diodes are conventionally combined.

3,748,597
OPTICAL MODULATORS

Franz Karl Reinhart, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1971, Ser. No. 193,286
Int. Cl. H01s 3/10
U.S. Cl. 333—7.51 16 Claims

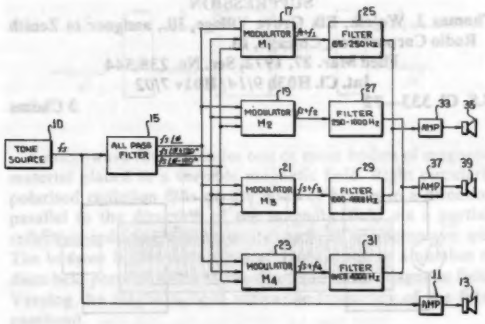


An optical phase modulator comprises a semiconductive body having first, second and thrid layers, the second layer being contiguous with and intermediate to the first and third layers and being of a material having a bandgap and free carrier concentration lower than that of both of the first and third layers. Optical radiation to be modulated is transmitted through the second layer across which is applied an electric field to effect the modulation. In a preferred embodiment the body and the field are mutually adapted so that a depletion layer is created coextensive with the second layer. Under this condition, the phase modulation per unit power and bandwidth achieves a relative maximum for the fundamental transverse mode. Structures which employ a p-n junction, as well as ones which do not, are disclosed. Optical polarization and intensity modulators are also described.

3,748,598
ORGAN TONE MODULATION SYSTEMS

Walter Munch, Jr., Park Hills; William S. Wagner, Ft. Thomas, both of Ky., and Dale M. Uetrecht, Cincinnati, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio

Division of Ser. No. 40,536, May 26, 1970, Pat. No. 3,626,077.
This application Dec. 7, 1971, Ser. No. 205,587
Int. Cl. H03c 3/00
U.S. Cl. 332—16 T 6 Claims

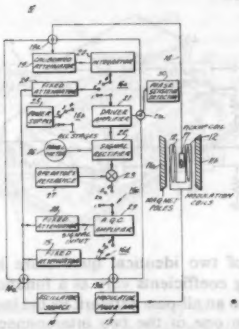


Organ output, comprising a band of audio frequencies, is divided into four frequency sub-bands, each of which is shifted in frequency by one of four respective diverse increments. The first and third sub-bands are acoustically transduced and radiated via a rotary loudspeaker and the second and fourth sub-bands via a stationary loudspeaker. These radiations are acoustically mixed with the radiated unmodified organ output to produce desired tonal effects. Frequency shifting of the sub-bands can be inhibited at will, means being provided automatically to maintain the acoustic signal level the same whether or not frequency shifting is in force, for a given setting of the expression pedal. Each of the four sub-bands can be shifted by either of two respective frequency increments, or inhibited, to permit selective variation of the overall acoustic effect. Frequency shifting for each sub-band is achieved by dividing the organ tone into three components of equal magnitude and 120° phase difference. To obtain the 120° spaced components, the input tone signal is applied to two phase shift filters which provide two of the components, the third component being derived by summing the first two components and inverting the resulting signal. Each component is applied to a respective section of four three-section modulators, each section comprising a transistor pair connected to form a DC differential amplifier with one input at AC ground. The emitter currents of each transistor pair are varied at the shift frequency by a three-phase oscillator, each modulator section being controlled by a respective oscillator phase. The outputs of each section of the modulator are combined to cancel the oscillator components provided at each section.

3,748,599
AMPLITUDE STABILIZER FOR MAGNETIC FIELD MODULATORS

Yosef Alon, Jerusalem, Israel, assignor to Yissum Research Development Company, Jerusalem, Israel

Continuation of Ser. No. 770,734, Oct. 25, 1968, abandoned.
This application Feb. 8, 1971, Ser. No. 113,655
Int. Cl. H03c 1/00
U.S. Cl. 332—39 11 Claims



A circuit for stabilizing the amplitude of magnetic field modulation conventionally applied to laboratory magnets delivers a phase coherent reference signal, in order to eliminate distortion caused by modulation changes in detecting of magnetic field dependent phenomena.

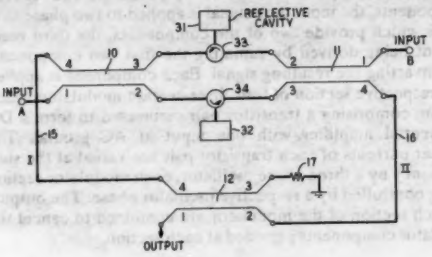
3,748,600
POWER COMBINING NETWORK

Reed Edward Fisher, Parsippany-Troy Hills Twp., Morris County, and John Ineson Smith, Mendham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1972, Ser. No. 248,701
Int. Cl. H03h 7/46
U.S. Cl. 333—10 5 Claims

If first and second noncoherent signals are combined in any simple hybrid network for application, for example, to a common antenna, each signal suffers a 3 dB loss. Furthermore, no simple phasing network suffices to obtain coherency if the signals are in nonoverlapping frequency bands. The present invention combines such signals by a network of hybrids and reflective reactive circuits that form third and fourth sum

signals from the first and second. The resulting signals are now coherent and can be combined without loss. The reflective



reactive circuit introduces a properly nonlinear phase characteristic that enhances the bandwidth over which the desired addition can be made.

3,748,601

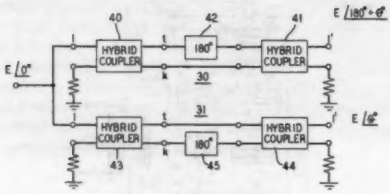
COUPLING NETWORKS HAVING BROADER BANDWIDTH THAN INCLUDED PHASE SHIFTERS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1971, Ser. No. 208,305

Int. Cl. H01p 5/14, 1/18

U.S. Cl. 333—10 **9 Claims**



A cascade of two identical quadrature hybrid couplers, whose coupling coefficients vary as a function of frequency, are converted to an all-pass network by the inclusion of a 180° phase shifter in one of the two interconnecting wavepaths. Recognizing that the incident signal is coupled primarily to one of the interconnecting wavepaths at the higher frequencies, and to the other wavepath at the lower frequencies, a phase shifter of limited bandwidth, placed in the appropriate wavepath, provides all-pass characteristics over a band of interest which is much broader than that of the phase shifter.

This technique is also employed to obtain broadband 180° phase shifters and transformers. By a boot-strapping technique, the band of interest can be further extended.

3,748,602

DETERMINATION OF EQUALIZER SETTING IN TELECOMMUNICATION SYSTEM

Egidio Alvazzi Delfrate, and Giuliano De Nicolay, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

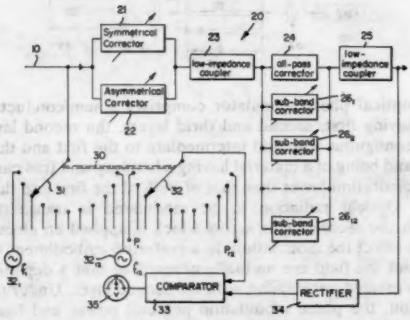
Filed June 8, 1972, Ser. No. 260,722

Claims priority, application Italy, June 11, 1971, 25718 A/71

Int. Cl. H04b 3/04, 3/10, 3/14

U.S. Cl. 333—28 R **12 Claims**

A wide-band equalizer for a telecommunication system includes a symmetrical corrector and an asymmetrical corrector, each encompassing the entire band, and a multiplicity of parallel corrective networks centered on the midfrequencies of respective sub-bands. A set of input registers, one for each sub-band, serve for the storage of error voltages representative of the deviations of the signal levels in the equalizer output from predetermined reference values as required under certain (e.g., seasonally variable) operating conditions. A correction simulator, switchable between a symmetrical and an asymmetrical position, generates a group of compensating voltages representing the effect of either of the two overall correctors upon the signal amplitudes in different zones of the band; a group of summing circuits differentially combine these compensating voltages with the stored error voltages relating to the same band zones to provide a composite voltage which is read on an indicator and is minimized



by adjustment of the two overall correctors. Thereafter, modified error voltages representing the residual deviations are fed into the input registers and thence to a resistance matrix distributing them to a multiplicity of output terminals, assigned to the several midfrequencies, with a polarity and step-down ratio corresponding to the effects of each corrective network upon the respective midfrequencies; a selector switch provides a reading of the cumulative effect of all the corrective networks upon each midfrequency, with the aid of a further summing circuit, as a basis for an individual readjustment of these networks.

3,748,603

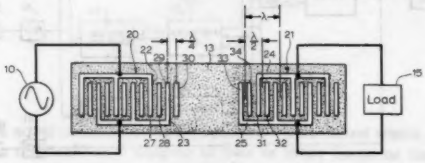
SURFACE WAVE FILTER WITH REFLECTION SUPPRESSION

Thomas J. Wojcik, Elk Grove Village, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 27, 1972, Ser. No. 238,544

Int. Cl. H03h 9/14; H01v 7/02

U.S. Cl. 333—72 **3 Claims**

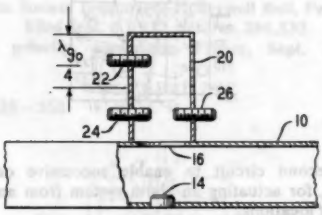


A SWIF includes a first transducer that launches acoustic surface waves along a propagating medium. A second transducer responds to those waves by developing an output signal. One or both transducers, certainly at least the output transducer, includes a pair of interleaved combs of conductive material disposed along the propagation path, adjacent teeth of the combs being spaced apart by a center-to-center distance of one-half the acoustic wavelength. Electrically isolated conductive ribbons are disposed individually between the teeth in respective different pairs of adjacent teeth. The center-to-center spacing between each of the ribbons and the ones of the teeth adjacent thereto is one-fourth the acoustic wavelength.

3,748,604
TUNABLE MICROWAVE BANDSTOP RESONANT CAVITY APPARATUS

Han-Chiu Wang, Salem, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 21, 1971, Ser. No. 136,075
Int. Cl. H01p 7/06, 5/04
U.S. Cl. 333—73 W 12 Claims

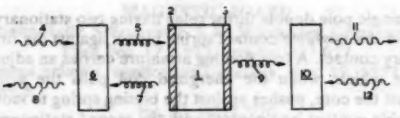


A rectangular microwave bandstop resonant cavity having a plurality of tuning screws in a configuration which permits the resonant frequency, the quality factor, and the effective electrical location of the cavity to be adjusted. These adjustments can be made either independently one of the other, or in any desired combination.

3,748,605
TUNABLE MICROWAVE FILTERS

Alexander Christopher Baynham, and Michael Robert Buchanan Dunsmore, both of Malvern, England, assignors to National Research Development Corporation, London, England

Filed Nov. 4, 1971, Ser. No. 195,737
Claims priority, application Great Britain, Nov. 5, 1970, 52,796/70
Int. Cl. H01p 1/20
U.S. Cl. 333—73 X 40 Claims



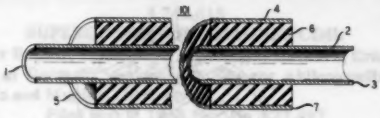
A microwave filter includes one or more bodies of magnetic material placed in a variable magnetic field. Right circularly polarised radiation falls on the body or bodies in a direction parallel to the direction of the magnetic field via a partial-reflection-inducing discontinuity such as a microwave iris. The body or bodies is or are preferably a disc or a number of discs held perpendicular to the direction of the magnetic field. Varying the magnetic field varies the frequency of the filter passband.

3,748,606
WAVEGUIDE STRUCTURE UTILIZING COMPLIANT CONTINUOUS SUPPORT

Stanley Kaufman, Flanders; Milton Lutchansky, Randolph Twp., Morris County, and Raffaele Antonio Sabia, Lincroft, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1971, Ser. No. 208,207
Int. Cl. H01p 1/00, 1/30, 3/12
U.S. Cl. 333—95 R 5 Claims

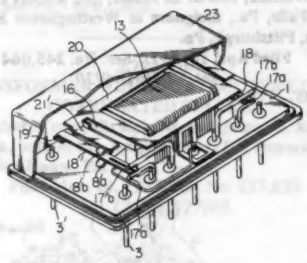
A waveguide structure is formed by supporting a waveguide section within a section of conduit by a low modulus continuous support material such as oil extended rubber which fills the space between the waveguide and conduit. This continuous support material eliminates distortions from weight loading induced deflections and provides substantial corrosion protection to the waveguide.



3,748,607
FLAT TYPE BALANCED ARMATURE RELAY

Tetsuo Mori, Hirakata; Hiromi Nishimura, Takaishi; Hideaki Yoshino, Katano, and Masami Morimoto, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 25, 1972, Ser. No. 283,732
Claims priority, application Japan, Sept. 30, 1971, 46/76734
Int. Cl. H01h 50/58
U.S. Cl. 335—125 7 Claims



A flat type balanced armature relay of a reduced height. Coil bobbin with exciting coil and yoke are placed in a pile on header plate of magnetic material and the yoke and header are coupled by a permanent magnet disposed at a side of the bobbin. Rockable armature having at both ends contact spring driving pins is contained axially in the bobbin. A frame member for fixing the pile and magnet to the header has an adjusting spring means for urging the driving pins to render the switching operation stable and disposed in a manner readily accessible from sideward for adjusting the urging pressure. By varying the pressure properly, the relay may be adapted to be of one-stable, two-stable or center-stable type.

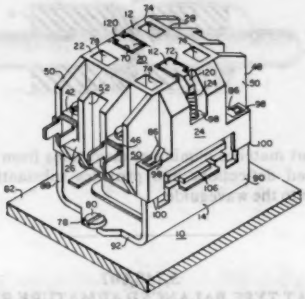
3,748,608
ELECTRIC CONTROL DEVICE

Kurt A. Grunert, and John J. Dauer, Jr., both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 17, 1972, Ser. No. 218,103
Int. Cl. H01h 50/02
U.S. Cl. 335—132 7 Claims

An electric control device for mounting on a control panel which device includes an assembly of an electrically insulating housing and of a mounting bracket in which assembly a contact carrier structure is movable between open and closed positions relative to a stationary contact structure by electromagnetic means against biasing means for holding the con-

tact carrier structure in one of the positions, and the assembly having means for readily detachably mounting the housing on

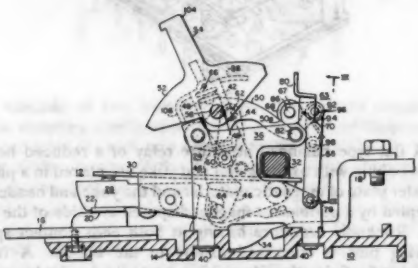


the bracket to facilitate access to the interior of the assembly without removal of the bracket from the mounting panel.

3,748,609
CIRCUIT INTERRUPTER

James B. Wallace; Alfred E. Maier, and Robert H. Hill, all of Beaver Falls, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 18, 1972, Ser. No. 245,064
Int. Cl. H01h *9/20*
U.S. Cl. 335—174 **12 Claims**



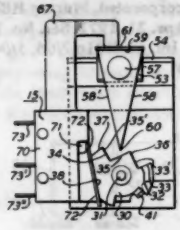
A circuit interrupter, such as a switch or a circuit breaker, comprising relatively movable contact means, operating means releasable to open the contact means, and trip means which may be responsive to ground fault currents through the contact means to effect the release of the operating means to open the contact means upon the occurrence of ground fault currents.

3,748,610
PULSE RELAY APPARATUS

Leo A. Guthart, Old Westbury, N.Y., assignor to Alarm Dvice Manufacturing Company, Syosset, N.Y.

Filed Feb. 7, 1972, Ser. No. 223,919
Int. Cl. H01h *3/28*
U.S. Cl. 335—190 **6 Claims**

A pulse relay apparatus. Actuating means are provided for relaying a pulse, generated by activation or de-activation of a first circuit, to a second circuit, to generate a responsive signal by activating or de-activating a switch in the second circuit, and switch engaging means are provided to engate the switch

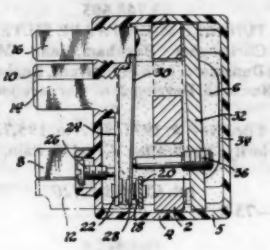


in the second circuit to enable successive on-off-on-off switching, for actuating an alarm system from any one of a number of locations.

3,748,611
RELAY

Thomas C. Heath, Anderson, Ind., assignor to General Electric Corporation, Detroit, Mich.

Filed Sept. 5, 1972, Ser. No. 286,310
Int. Cl. H01h *1/48*
U.S. Cl. 335—197 **2 Claims**

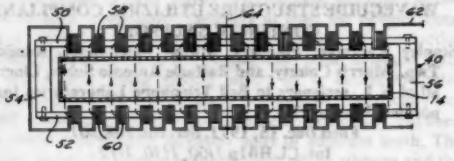


A single pole double throw relay having two stationary contacts and a movable contact spring biased against the first stationary contact. A free floating armature carries an adjustable finger which, when the energized coil pulls the armature against the core, pushes against the biasing spring to move the movable contact into contact with the second stationary contact. During manufacture, the second stationary contact can be moved by an adjusting screw to set the air gap, and the adjustable finger can be adjusted to set spring over-travel.

3,748,612
CHARGED PARTICLE BEAM DEFLECTION CONTROL YOKE

Zia Hashmi, Austin, Tex., and David H. McNitt, Royal Oak, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1971, Ser. No. 198,599
Int. Cl. H01f *7/00*
U.S. Cl. 335—210 **5 Claims**



A control yoke for deflecting a beam of electrically charged particles is described. The yoke includes a pair of parallel and

spaced bars on each of which a plurality of electrical coils are positioned. The bars are made from a magnetic material. Current in the coils produces a magnetic field between the bars which varies in flux density, thereby, to vary the amount of deflection of the beam.

3,748,613

PRINT DEVICE FOR A PRINTER

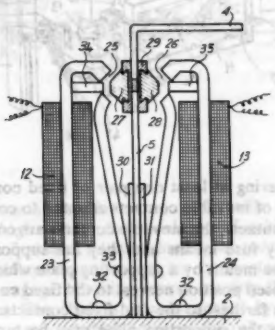
Hilrich Jan Matthijs Venker, Heemstede, Netherlands, assignor to Societe Industrielle Honeywell Bull, Paris, France

Filed Sept. 5, 1972, Ser. No. 286,533

Claims priority, application France, Sept. 17, 1971, 7133571

Int. Cl. H01f 7/18

U.S. Cl. 335—268 6 Claims



A striking device is provided for a printer in which the print hammer is integral with the free end of a flexible plate, the other end being stationary. The device includes two independent magnetic circuits with mobile armatures which are attached to said flexible plate and are capable of bending this plate in either of two opposite directions.

3,748,614

MAGNETIC BOARD

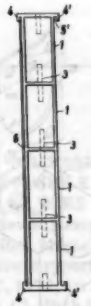
Hermann Holtz, Seerobenstr. 7, 62 Wiesbaden, Germany

Filed Feb. 17, 1972, Ser. No. 227,077

Claims priority, application Germany, Nov. 17, 1971, G 71 43 245.6

Int. Cl. H01f 7/20

U.S. Cl. 335—285 7 Claims



A magnetic board for mounting paramagnetic adhering objects, such as letters, symbols, numbers and the like, the board having at least one permanent or ferromagnetic surface and assembled in hollow rectangular or square-shaped pieces made of plastic material into which plate-like or strip-like permanent or ferromagnetic material is mounted on either one or both sides of the board. The board may also include a plurality of longitudinal ruled lines on one or both sides.

3,748,615

SUPERCONDUCTING MAGNET COIL

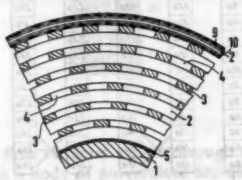
Gunther Bogner, Tennenlohe, and Helmut Kuckuck, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 7, 1969, Ser. No. 822,497

Claims priority, application Germany, May 7, 1968, P 17 64 268.1

Int. Cl. H01f 27/10

U.S. Cl. 336—60 4 Claims



Described is a superconducting magnet coil wherein a superconductor is arranged in several winding layers and channels admitting a coolant, which are formed by cooling strips, are between the winding layers. The superconducting magnet coil is characterized in that the height of the cooling channels is approximately 0.1 to 0.2 mm.

3,748,616

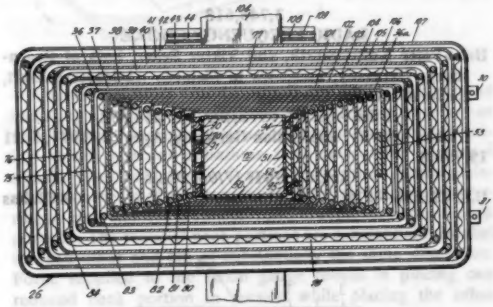
TRANSFORMER WINDING STRUCTURE USING CORRUGATED SPACERS

Hans J. Weber, Cornwells Heights, and James R. Ruckel, King of Prussia, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Mar. 24, 1972, Ser. No. 237,639

Int. Cl. H01f 27/08

U.S. Cl. 336—60 8 Claims



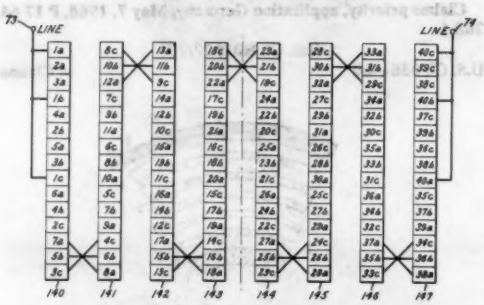
Corrugated spacers are disposed between winding layers of a transformer winding to enable circulation of air between the layers. Elongated reinforcing rods are placed in corrugations at the corner regions of the winding and adjacent wedges between the winding and the transformer core. Dielectric sheaths of relatively high dielectric constant are disposed between the outermost and innermost winding layers while relatively low dielectric constant sheaths are placed between adjacent pairs of interior layers, thereby to equalize the distributed capacitance between adjacent layers. A dielectric barrier between the high and low voltage windings of a transformer consists of a sheath of dielectric layers wherein the inner and outermost layers have a higher dielectric constant than the interior layers.

3,748,617

MULTISTRAND WINDINGS WITH INCREASED SERIES CAPACITANCE

John C. Crouse, Rome, Ga., assignor to General Electric Company

Filed Apr. 27, 1972, Ser. No. 248,124
Int. Cl. H01f 15/14, 27/28
U.S. Cl. 336—70 4 Claims



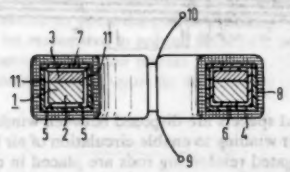
High series capacitance plural strand disk windings. The windings include an end portion whose turns are physically disposed in the following order starting with an end terminal: N plural turns of a first conductor, a single turn of a second conductor and M plural turns of the first conductor and the second conductors alternating sequentially. The winding may also include another portion, serially connected to the first mentioned portion and including plural turns physically disposed in the following order: one turn of the first conductor, R turns of the second conductor and S plural turns of the first and second conductors alternating sequentially. Windings including three or more conductors are constructed in similar manners.

3,748,618

RADIO FREQUENCY CHOKE

Hans-Peter Kaiserswerth, and Viktor Seiler, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 17, 1972, Ser. No. 244,478
Claims priority, application Germany, Apr. 23, 1971, P 21 19 950.8
Int. Cl. H01f 17/06, 27/26
U.S. Cl. 336—178 8 Claims



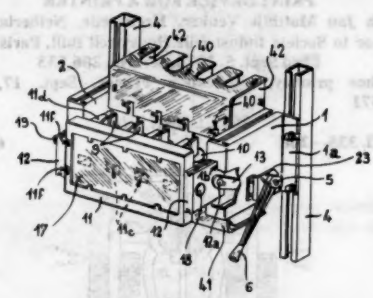
A radio frequency choke for reducing radio frequency interference in switching circuits as for example for gating bidirectional alternating current comprising a composite core with a first portion formed of ferrite material and a second portion formed of laminations of magnetic sheet material. The ferrite and laminated portions may be annular shaped and the radio frequency interference is substantially reduced if an air gap is provided in the ferrite core.

3,748,619

ELECTRIC SWITCHES EQUIPPED WITH FUSE MEANS

Michel Chambon, Rhone, France, assignor to Lucien Ferraz & Cie, Lyon, France

Filed June 26, 1972, Ser. No. 266,394
Int. Cl. H01h 85/22
U.S. Cl. 337—9 8 Claims



A switch having at least one pair of fixed contacts and at least one pair of movable contacts adapted to cooperate with these fixed contacts, the movable contacts are connected with each other by fuse means and they are supported together with these fuse means by a supporting plate which is movable between a closed position nearest to the fixed contacts and an open position farthest to the said fixed contacts. When at the open position the supporting plate may be turned on itself through 180° so as to bring the fuse means on what is now its outer side, where they are separated from the live parts of the switch by the supporting plate itself. The switch may then be brought to an ineffective closed position for which the supporting plate wholly covers the fixed contacts and forms a closure for the open side of the switch casing.

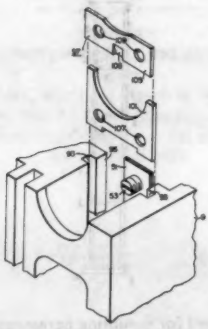
The fuse means of each pair are preferably in the form of a removable fuse cartridge having end blades which constitute the movable contacts.

3,748,620

CIRCUIT BREAKER WITH IMPROVED BARRIER MEANS

James P. Ellsworth, Beaver, and Nick Yorgin, Ambridge, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 1, 1972, Ser. No. 258,593
Int. Cl. H01h 61/08
U.S. Cl. 337—20 9 Claims



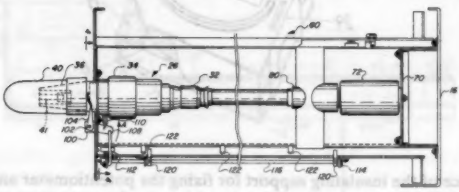
An insulating-housing type circuit breaker is provided with openings in the housing to facilitate final trip adjustment after assembly of the breaker, and improved barrier means for closing the openings after the adjustment is made.

3,748,621

LOCKING MECHANISM

Gerald Sakats, Arlington Heights, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Sept. 25, 1972, Ser. No. 292,263
Int. Cl. H01h 71/10
U.S. Cl. 337—173 5 Claims



A locking mechanism for a removable roller mounted fuse drawer of a high voltage fuse enclosure. Locking levers are mounted on a first shaft adjacent loadbreak connectors so that when the loadbreak connectors are connected to fuse terminals they engage blocking levers causing the levers and shaft to pivot. The shaft is interconnected by a linkage arrangement to a second shaft adjacent the roller mounted fuse drawer. Mounted on the second shaft are blocking cams which engage stops on the fuse drawer to prevent movement of the fuse drawer when the loadbreak connectors are connected. When the loadbreak connectors are manually disconnected from the fuse terminals breaking the circuit to the fuses, the blocking levers and first shaft pivot causing the linkage arrangement to rotate the second shaft and move the blocking cams out of engagement with the drawer stops thus permitting the fuse drawer to be removed from the fuse enclosure. The fuse drawer can then be removed so that the fuses can be tested or replaced. The blocking cams prevent replacement of the fuse drawer in the fuse enclosure if any of the loadbreak connectors are reconnected to the fuse terminals after the fuse drawer is removed from the fuse enclosure. Thus, the fuse drawer can neither be opened nor closed any time a loadbreak connector is connected to the circuit thus preventing either opening of the fuse drawer when the fuses are under electrical load or closing the fuse drawer into an electrically loaded circuit.

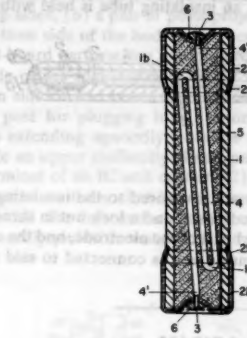
3,748,622

ELECTRIC FUSE WITH FUSIBLE ELEMENT IN FORM OF A WIRE

Frederick J. Kozacka, South Hampton, N.H., and Philip C. Jacobs, Jr., Newtonville, Mass., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Filed Dec. 7, 1972, Ser. No. 312,920
Int. Cl. H01h 85/18
U.S. Cl. 337—276 3 Claims

An extremely compact electric fuse for small current ratings having a wire type fusible element whose length by far exceeds the length of the tubular casing. The fusible element forms two hair pin loops between the ends thereof and is surrounded by a sleeve of glass fibers normally preventing short-circuiting of contiguous sections of the fusible element in wire form and being so porous that it allows upon blowing of the fuse under major fault conditions, or short-circuit conditions, a substantially unimpeded flow of metal vapors through the aforementioned sleeve into a body of pulverulent arc-quenching filler inside the casing surrounding the sleeve.

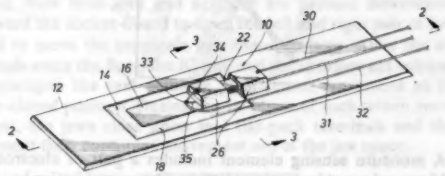


3,748,623

PRESSURE TRANSDUCERS

Huntly Drummond Millar, Houston, Tex., assignor to Millar Instruments, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 158,884, July 1, 1971, abandoned. This application July 25, 1972, Ser. No. 274,874
Int. Cl. G01l 1/22
U.S. Cl. 338—4 4 Claims



A novel miniature blood pressure transducer is described including a catheter tip transducer implantable in an artery or vein. The transducer employs a novel strain gauge for converting blood pressure pulsations into measurable electrical signals. The strain gauge is formed of two strain sensitive elements composed of a piezoresistive material. The strain occurring in each element is concentrated in separate reduced neck portions. The reduced neck portions are substantially parallel to each other and are of substantially the same dimension. Force supplied to the strain gauge results in placing one reduced neck portion in tension while placing the other reduced neck portion in compression.

3,748,624

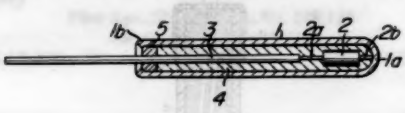
PYROMETRIC SENSOR USING THERMISTOR

Akio Yazawa, Oobu, and Tadashi Hattori, Nishio, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed Feb. 25, 1972, Ser. No. 229,491
Claims priority, application Japan, Mar. 30, 1971, 46/18995
Int. Cl. H01c 7/00
U.S. Cl. 338—30 4 Claims

A pyrometric sensor using a thermistor which is highly resistant to vibrations and heat, comprising a heat-sensing unit formed by inserting a pyrometric thermistor into a metallic protecting tube, connecting lead wires of the thermistor to the protecting tube and a center electrode, and packing a heat-re-

sistant insulating material into said protecting tube. The section of the heat-sensing unit where the thermistor is not located is partly inserted into a hole of an adapter for receiving the protecting tube, an insulating tube is held within the



adapter, an upper electrode is secured to the insulating tube by a flange of the electrode itself and a lock nut in thread engagement with a threaded part of the electrode, and the center electrode of the heat-sensing unit is connected to said upper electrode.

3,748,625

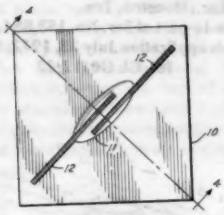
MOISTURE SENSING ELEMENT AND METHOD OF MAKING SAME

Paul F. Bennewitz, Albuquerque, N. Mex., assignor to Thunder Scientific Corporation, Albuquerque, N. Mex.

Filed Jan. 6, 1972, Ser. No. 215,802

Int. Cl. H01c *13/00*

U.S. Cl. 338—34 **18 Claims**



A moisture sensing element includes a pair of electrodes held spaced apart by a crystal lattice. The crystal lattice has interstitial spaces formed therein and is electrically neutral so that molecules of atmosphere having water ions therein randomly drift in and out of the crystal interstices. The resistance of the sensing element varies as a function of the per cent of water vapor present in the interstices of the crystal lattice. The sensing element may be formed by embedding platinum-iridium wires in a Cr_2O_3 - V_2O_5 mixture and baking the mixture in the presence of Al_2O_3 doping chips.

3,748,626

MINIATURIZED POTENTIOMETER

Jean Maurice, Nice, France, assignor to Societe Francaise De L'Electro-Resistance, Nice, France

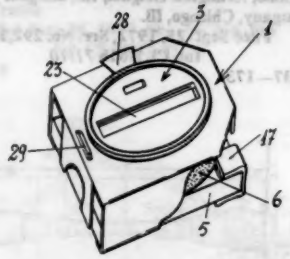
Filed Aug. 8, 1972, Ser. No. 278,865

Claims priority, application France, Aug. 31, 1971, 7131510

Int. Cl. H01c *9/02*

U.S. Cl. 338—162 **13 Claims**

A rotary-contact potentiometer which is primarily intended to be employed in miniaturized hybrid circuits. It comprises a metallic casing which contains the rotary slider and its actuating member and a circular resistive track deposited on an insulating support. The casing has an open structure and is provided on one of its faces with a circular opening for guiding and centering the slider-actuating member. The opposite face to said opening is the external face of the insulating support of the resistive track. Three metallized zones are formed on said



face of the insulating support for fixing the potentiometer and establishing electrical connections between the potentiometer and the electric circuit.

3,748,627

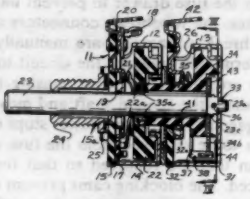
COMBINATION VARIABLE RESISTANCE AND ELECTRICAL SWITCH CONTROL

John Zdanys, Jr., Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 761,602, Sept. 23, 1968, Pat. No. 3,567,876. This application Jan. 6, 1971, Ser. No. 104,286

Int. Cl. H01c *5/08*

U.S. Cl. 338—172 **9 Claims**



An electrical control has a variable resistance control combined with a normally open switch. Any manual adjustment made to the variable resistance control causes the switch contacts to be closed before actual adjustment of the variable resistance control begins and, after the force causing manual adjustment of the control is removed, the switch contacts are opened without disturbing the resistance setting of the control.

3,748,628

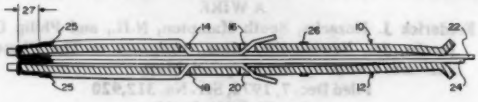
PRINTED WIRING CABLE TERMINATION

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 15, 1972, Ser. No. 263,344

Int. Cl. H01r *13/58*; H05k *1/07*

U.S. Cl. 339—17 F **5 Claims**

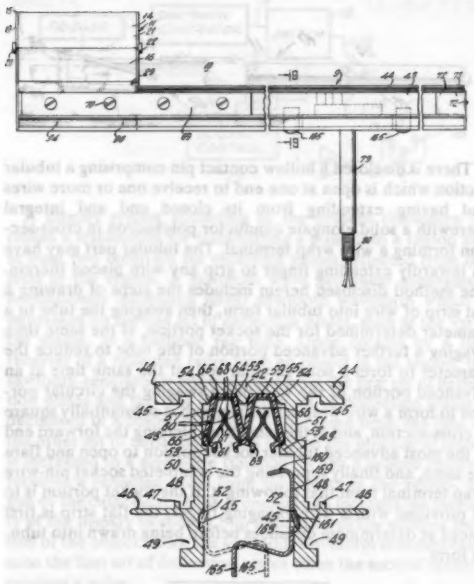


There is herein disclosed a termination card for printed wiring cables wherein the cables are routed through apertures in a pair of cards which are fastened together to provide both cable clamping and strain relief. Electrical coupling is provided by the cables themselves without any electrical connection to the termination card.

3,748,629
ELECTRICAL FIXTURE COUPLING AND SUPPORT APPARATUS

Edison A. Price, 17 King St., New York, N.Y.

Filed Apr. 15, 1971, Ser. No. 134,341
Int. Cl. H01r 9/00
U.S. Cl. 339—21 R 4 Claims



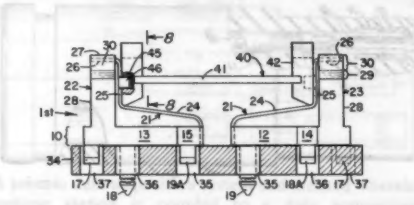
An electrical fixture support and current feed system includes an inverted metal track channel which is coupled to a junction box with converging side walls and houses in its upper part a longitudinal double channel insulator body. Nesting in each of the insulator channels is a longitudinal conductor bus having upwardly converging curved fingers resiliently urged into mutual engagement. The metal channel has grooves formed in the lower border of its inner faces. A plug assembly includes an insulator body member having an upper cavity closed by a hinged lid and supporting a first contact member with a first prong, a second contact member with a second prong and a first clip, and a second clip, the clips being located in the cavity. First and second conductors extend through a metal conduit depending from the body member and are connected to the first contact member and the second clip and a fuse is engaged by the clips. Outwardly sprung detent-carrying arms are located on the body member. The detents releasably engage the channel grooves when the plug registers with the metal channel and the prongs engage the bus fingers and upon insertion of the plug, the arms engage the track channel inner faces before the prongs engage the conductors.

3,748,630
IC UNIT CARRIER AND ITS ELECTRICAL INTERCONNECTORS

Samuel C. Robinson, New Albany, Ind., assignor to Robinson-Nugent, Inc., New Albany, Ind.

Filed Aug. 10, 1971, Ser. No. 170,605
Int. Cl. H01r 13/62
U.S. Cl. 339—74 R 17 Claims

An IC (integrated circuit) unit carrier comprising: A. a horizontal socket-board of the flat panel type having an allochiral arrangement of vertically extending perforations, including a left pair of thickness-traversing perforations spaced transversely from a right pair of corresponding perforations; B. an allochiral arrangement of left and right electrical interconnectors for said perforations, (1) each interconnector comprising (a) an electrically conductive body having bottom and top sides, (b) a pair of posts projecting downwardly from the bottom side of the body into a corresponding pair of said socket-board perforations to mount the interconnector on the top side of the socket-board, one of said posts providing the bottom side of said board with a downwardly-projecting terminal post for plugging into a main panel board, and (c) means extending upwardly from the top side of the body to provide an upper resiliently-closed pair of jaws for an electrical terminal of an IC unit carrier, (2) the left and right interconnectors on the socket-board cooperating with each other to provide the left and right halves of an upwardly-open downwardly-yieldable seat; and C. an actuator (1)bridging the

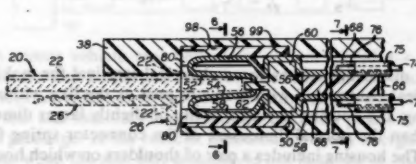


horizontal space between interconnectors and (2) mounted on said yieldable seat (a) for manually actuated downward movement against the seat to open the corresponding left and right pairs of jaws and (b) for seat-actuated upward return movement to close said left and right pairs of jaws. In use, an IC unit is placed against the top or back faces of an actuator seated on the carrier with one left and one right end terminal of the IC unit overlying one left and one right pair of closed jaws. Now both unit and actuator are pressed downwardly toward the socket-board to open the left and right pair of jaws and to move the terminals into the open jaws. After the terminals enter the jaws, the IC unit and the actuator are released whereupon the seat actuates their return movement to the jaw-closed position. During the 1st phase of such return movement, the jaws close upon said flat-pack terminals and thus prevent their continued movement out of the jaw space.

3,748,631
CORD CONNECTOR FOR PRINTED WIRING CARDS

William J. Brorein, Whippany, N.J., assignor to General Cable Corporation, New York, N.Y.

Filed May 18, 1971, Ser. No. 144,594
Int. Cl. H01r 13/58; H05k 1/02
U.S. Cl. 339—176 MP 20 Claims



This electric cable connector for printed wiring cards has an insert spacer at the location where the contacts of the connector are joined to the conductors of the cable and between the upper and lower layers of contacts when the connector is for a double-faced printed wiring card. The spacer has channels for the individual contacts with the sides of the channels forming barriers between adjacent contacts and providing for convenient soldering of the conductors to the contacts of the connector. The use of shrink tubes is no longer necessary. The connector assembly has a shell or housing that houses the con-

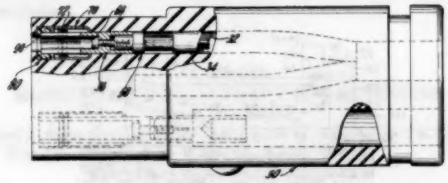
nector body, the spacer and the wires of the electrical cable; and there is a polarizing tongue extending from the housing in position to cooperate with a depression in the handle of a printed wiring card.

3,748,632

INSULATED ELECTRICAL CONNECTOR

John H. Tanges, Jr., Ormond Beach, Fla., assignor to Florida General Electronics Inc., Ormond Beach, Fla.

Filed May 4, 1972, Ser. No. 250,445
Int. Cl. H01r 13/16
U.S. Cl. 339—196 R 2 Claims



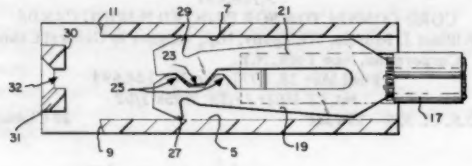
An improved electrical connector of the type having a plurality of contacts is provided with means for accurately locating the contact so that the mating connector may be assembled therewith. Simplified means are also provided for improving the internal electrical connections within the connector.

3,748,633

SQUARE POST CONNECTOR

Robert Graham Lundergan, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 24, 1972, Ser. No. 220,022
Int. Cl. H01r 9/08
U.S. Cl. 339—217 S 1 Claim



The disclosure relates to an electrical terminal for making electrical connection with a square post or the like within a housing, the housing having a cavity of slightly larger dimension than the normal dimension of the connector spring fingers. The housing includes a pair of shoulders on which hooks or projections at the end of the terminal spring fingers lock upon complete insertion of the terminal within the housing. One spring finger includes teeth thereon and the other spring finger includes a tooth mateable with the teeth on the first finger in order to allow both fingers to be pushed together to a great degree. The terminal is designed so that the innermost portion of one of the spring fingers is spaced from the innermost portion of the other of the spring fingers by an amount less than the cross-sectional area of the square post terminal to be inserted therein so that the projections or hooks will be locked firmly on the shoulders upon insertion of the square post.

3,748,634

HOLLOW CONTACT PIN WITH WIRE WRAP TERMINAL AND METHOD OF MAKING SAME

Robert E. Barnes, Trumbull, and Nelson A. Secor, Danbury, both of Conn., assignors to The Bead Chain Manufacturing Company, Bridgeport, Conn.

Filed Sept. 9, 1971, Ser. No. 179,074
Int. Cl. H01r 11/08, 11/22
U.S. Cl. 339—258 R 1 Claim

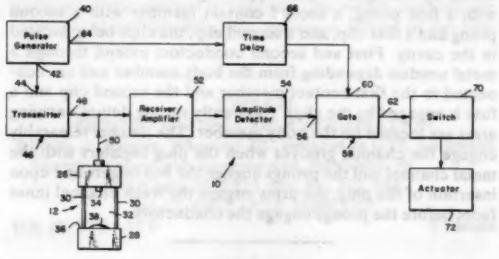
There is disclosed a hollow contact pin comprising a tubular section which is open at one end to receive one or more wires and having extending from its closed end and integral therewith a solid elongate conductor polyhedron in cross-section forming a wire wrap terminal. The tubular part may have an inwardly extending finger to grip any wire placed therein. The method disclosed herein includes the steps of drawing a flat strip of wire into tubular form, then swaging the tube to a diameter determined for the socket portion, at the same time swaging a further advanced portion of the tube to reduce the diameter to form a solid circular rod, at the same time at an advanced portion of the workpiece swaging the circular portion to form a wire wrap terminal which is substantially square in cross-section, and at the same time piercing the forward end of the most advanced tubular socket portion to open and flare the same, and finally separating the completed socket pin-wire wrap terminal from that following it. If the socket portion is to be provided with a wire-engaging finger, the flat strip is first lanced at determinate distances before being drawn into tubular form.

3,748,635

AIRCRAFT SUBMERGENCE DETECTOR

John J. Phillips, Rolling Hills, Calif.; Gerald J. Posakony, Boulder, Colo., and Roger C. Stephenson, Woodland Hills, Calif., assignors to G & H Technology, Inc., Santa Monica, Calif.

Filed Aug. 5, 1971, Ser. No. 169,364
Int. Cl. G01s 9/66
U.S. Cl. 340—1 L 8 Claims



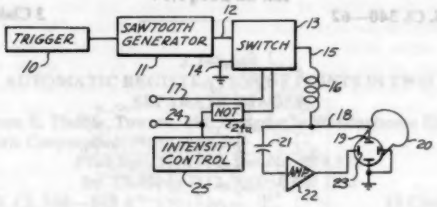
A system is disclosed for detecting the presence of a fluid. The present detection system is shown on an aircraft and is effective to detect flooding of the aircraft as occurs when the aircraft is submerged in water. The present detection system includes a sensor which has transducer means for transmitting and receiving energy such as ultrasonic energy through an air space which may fill with the water. The energy has entirely different propagation characteristics; i.e., attenuation and velocity through air and water whereby the changes in the transmission of the ultrasonic energy indicates whether the air space has filled with water.

3,748,636

DISPLAY SYSTEM

John F. Corbani, Santa Barbara, Calif., assignor to Sloan Technology Corporation, Santa Barbara, Calif.

Filed July 7, 1970, Ser. No. 52,915
Int. Cl. G01s 9/68
U.S. Cl. 340—3 R 10 Claims



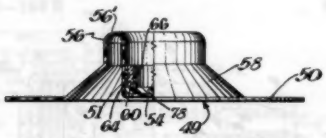
A display system according to the present disclosure includes a transmitter for transmitting a pulse into a region and at least two receivers for receiving pulses reflected from objects in the region. A sawtooth wave generator generates a continuously increasing linear sawtooth waveform which is impressed on the one set of deflection plates, such as the vertical plates, of a cathode ray tube. Upon receipt by a first receiver of a reflected pulse from an object in the region, the sawtooth generator is disconnected from the first set of deflection plates and the bias on the first set of deflection plates is decreased in a cosine function. At the same time, the bias on the other set of deflection plates such as the horizontal plates, is increased in a sine wave function. When a second receiver receives a reflected pulse from the object in the region, the gun of the cathode ray tube is operated to increase the intensity of the display to show a blip indicative of the relative location of the object. Also, the sawtooth waveform is reimpressed onto the first set of deflection plates when the second receiver receives a pulse.

3,748,637

SONAR TRANSDUCER ASSEMBLY

Robert J. Larson, Newark, Del., and Charles W. Stevens, Jr., Kennett Square, Pa., assignors to C. W. S. Industries, Inc., Kennett Square, Pa.

Filed Oct. 22, 1971, Ser. No. 191,745
Int. Cl. H04b 13/00
U.S. Cl. 340—8 R 14 Claims



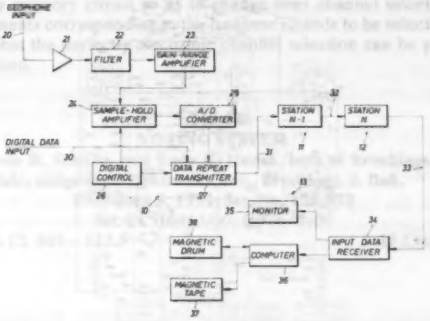
The sonar transducer assembly described includes a seamless diaphragm having a hollow cylindrical cavity closed at one end, an axis perpendicular to the plane of the diaphragm, an annular 45° reflector, and an annular decoupling ring between the cavity and the reflector. A cylindrical sound transducer is positioned within the cavity such that when it is energized, the sound waves are generated radially outward through the cavity wall until reflected by the reflector along the axis of the diaphragm. This diaphragm may be positioned within a flange mounted in the nozzle or exhaust pipes of bulk storage bins or tanks. The seamless diaphragm insulates the transducer from any corrosive effects of the material stored therein and at the same time permits the sound waves to travel down to the storage enclosure for determination of the level of the material stored therein.

3,748,638

SEISMIC EXPLORATION SYSTEM

William C. Montgomery, Jr., Houston, Tex., and William R. Orr, Bellaire, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 8, 1971, Ser. No. 196,400
Int. Cl. G01v 1/22
U.S. Cl. 340—15.5 MC 10 Claims



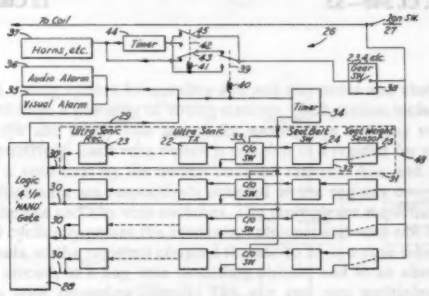
A seismic data acquisition system and method wherein each geophone station is coupled to a data acquisition and telemetry unit module with individual modules being coupled to each other and a central recording station by a single data link such as a coaxial cable, a pair of conductors or radio link.

3,748,639

SAFETY BELT ALARM SYSTEM

Thomas J. L. Dobedoe, 10 Red House Gardens, Wateringbury; Ronald F. Robins, 19 Elm Grove, Thorpe Bay, and Frederick J. Brookes, Arley House, Bulphan, Upminster, all of England

Filed Nov. 26, 1971, Ser. No. 202,464
Int. Cl. B60r 21/00
U.S. Cl. 340—52 E 9 Claims



A motor vehicle seat belt alarm system includes a body structure and a seat belt assembly. Transmitter and receiver devices are attached to the body structure and to a portion of the seat belt assembly to determine if the latter passes in front of a passenger in the vehicle. Electrical circuitry energizes an alarm when the seat belt assembly is not fastened or properly positioned. The transmitter device may produce an ultrasonic signal.

3,748,040

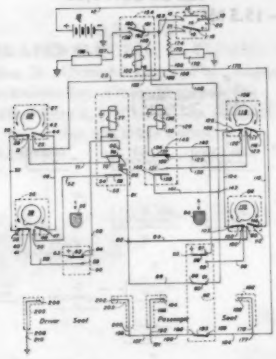
SEAT BELT SYSTEM FOR AUTOMOTIVE VEHICLES

Vincent Sardo, Jr., 220 W. Skyline Lake Dr., Ringwood, N.J.

Filed Dec. 21, 1971, Ser. No. 210,327
Int. Cl. B60q 1/00; B60r 21/10
U.S. Cl. 340—52 E 8 Claims

The circuit of this invention provides a safety belt system for both shoulder and seat belts which require the driver and any

passengers to positively fasten the seat and shoulder harness in a sequential manner in order for the automobile to be started. After the engine is started, disconnection of any belt or har-



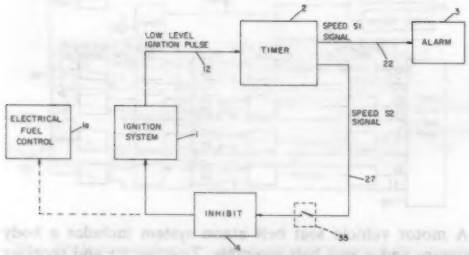
ness causes a buzzer or like alarm to be actuated. The circuit is shown as being operable with either of two relay systems. One system uses a latching relay the other uses a stepping relay.

3,748,641

SPEED LIMITER AND ALARM FOR INTERNAL COMBUSTION ENGINE

Dudley B. Hartung, 26 Appleton St., Somerville, Mass.

Filed Sept. 17, 1971, Ser. No. 181,376
Int. Cl. B60q 1/54
U.S. Cl. 340—53 **12 Claims**



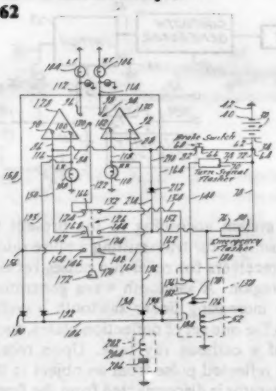
Speed limiter and alarms for internal combustion engines, especially automobiles. Signals from the ignition system trigger the limiter or alarm devices. Shift registers and digital counters shift with or count pulses spaced apart in accordance with automobile speed. Reaching a certain stage or count prior to a timed reset pulse results in a generation of a signal useful to set an alarm or inhibit the speed. Cyclic operation of the system maintains a constant watch on the speed. A flip flop set by coincidence of the shift stage or count and a reset pulse energizes the signal, and absence of the shift stage or count at the time of a reset pulse, unsets the flip flop, deactivating the signal. The signal can energize or de-energize electronic or conventional warning, ignition or fuel pump devices.

3,748,642

EXTERNAL HIGH SPEED WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Bernard G. Radin, Oak Park, and Lawrence J. Vanderberg, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 103,212, Dec. 31, 1970, abandoned. This application May 2, 1972, Ser. No. 259,094
Int. Cl. B60q 1/54
U.S. Cl. 340—62 **3 Claims**



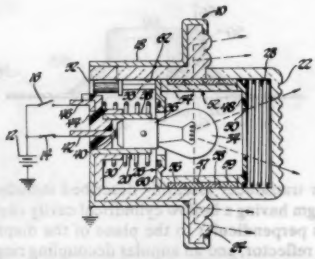
An external high speed warning system for an automotive vehicle in which the normal turn signals of the vehicle are all energized intermittently when the speed of the automotive vehicle exceeds a predetermined limit. A speed responsive switch means is provided which energizes all four of the turn signal lamps from a source of electrical energy through a flashing switch when the predetermined speed limit has been reached. This speed limit may be in the range of 80 to 90 miles per hour. An audible warning means may also be provided which is energized when this predetermined speed limit has been reached.

3,748,643

INERTIALLY-ACTUATED TAILLIGHT SYSTEM

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1971, Ser. No. 173,915
Int. Cl. B60q 1/44
U.S. Cl. 340—71 **3 Claims**



Vehicle taillight apparatus for indicating changes in vehicle speed. The taillight assembly includes a continuously energized lamp and first and second lenses fixedly secured to the vehicle so the lenses transmit light from the lamp rearwardly of the vehicle. A screen assembly including a first screen having a central aperture and a second screen having colored sections is slidably positioned between the lamp and the first lens so only light passing through the aperture strikes the first lens and only light passing through a colored section strikes the second lens. The screen assembly is biased to a certain posi-

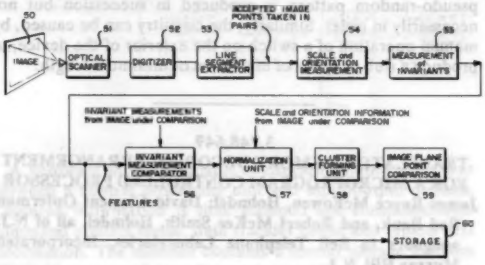
tion so inertial forces on the screen assembly due to vehicle acceleration and deceleration move the screen sufficient to vary the amount of light emanating from the first lens and the color of light emanating from the second lens. The taillight assembly also includes a brake switch actuated electromagnet for moving the screen assembly to a position indicative of maximum deceleration whenever the vehicle brakes are applied.

3,748,644

AUTOMATIC REGISTRATION OF POINTS IN TWO SEPARATE IMAGES

Glenn E. Tisdale, Towson, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,510
Int. Cl. H04n 7/12, 3/00; G06f 7/00
U.S. Cl. 340—149 A **19 Claims**



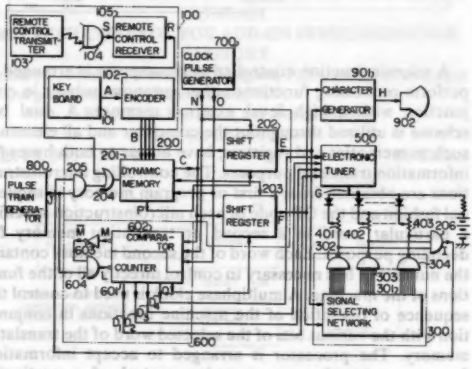
Features are extracted from a two-dimensional image for subsequent comparison with features extracted from a further two-dimensional image to determine whether the separate images have at least one area in common, and if so, to provide automatic registration of points of correspondence in the two images in the area or areas in common.

3,748,645

CHANNEL SELECTOR

Kazumi Kawashima, Settsu-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed July 21, 1972, Ser. No. 273,736
Claims priority, application Japan, July 23, 1971, 46/55490; July 23, 1971, 46/55491
Int. Cl. H04b 1/26
U.S. Cl. 340—168 R **4 Claims**



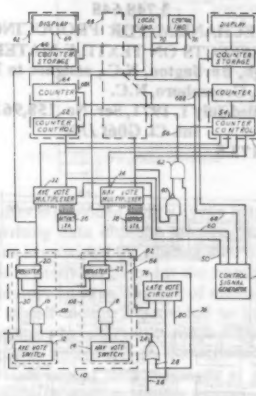
In a channel selector electronically operated a channel selecting signal from a key board or a remote control circuit is applied to a binary memory circuit, the content of the binary memory circuit is statically derived and used to cause a gate circuit to deliver an output corresponding to the content of the binary memory circuit, the output is then applied to a variable resistor which has a certain channel selecting voltage preset thereacross, and the channel selecting voltage is applied to the variable capacitance diode of an electronic tuner while a frequency band change-over voltage is derived from the multiplexer of a counter electrically associated with the binary memory circuit so as to change over channel selecting elements corresponding to the frequency bands to be selected, so that the perfectly electronic channel selection can be performed.

3,748,646

VOTING SYSTEM

Steven H. Schultz, and Rudy R. Unruh, both of Brookings, S. Dak., assignors to Daktronics, Inc., Brookings, S. Dak.

Filed June 8, 1971, Ser. No. 150,952
Int. Cl. H04j 3/00; G07c 13/00
U.S. Cl. 340—172.5 **15 Claims**



A voting system for totaling aye and nay votes and abstentions from a plurality of voting stations. Each station includes an aye and a nay vote switch for casting aye and nay votes respectively. Each vote switch is coupled to a register for storing a vote cast by the switch coupled thereto. Aye and nay multiplexers are respectively coupled to the register coupled to the aye and nay vote switches. The multiplexer sequentially and cyclically passes the contents, vote-cast and vote-not-cast signals, of the registers coupled thereto to an aye vote recording circuit, to a nay vote recording circuit, and to an abstention vote recording circuit. The aye and nay multiplexers operate in synchronism so that an abstaining voting station will simultaneously pass an aye vote-not-cast signal and a nay vote-not-cast signal through the aye and nay multiplexers. The abstention vote recording section treats such simultaneous receipt of aye and nay vote-not-cast signals as an abstention.

3,748,647

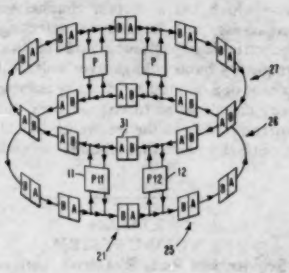
TOROIDAL INTERCONNECTION SYSTEM

Ron Ashany, and Arwin B. Lindquist, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,177
Int. Cl. G06f 15/16
U.S. Cl. 340—172.5 **10 Claims**

Units of a data processing system intercommunicate on ring connections of shift registers. A message placed in one shift register stage is advanced from stage to stage until it is removed at a destination stage or at an intermediate stage.

Several rings are interconnected in a toroidal arrangement so that a message can be transferred at an intermediate stage



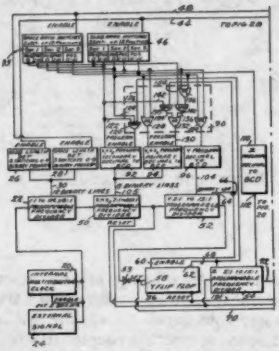
from one ring to an adjacent ring. Logic is provided for advantageously routing the message between the initial stage and the destination stage.

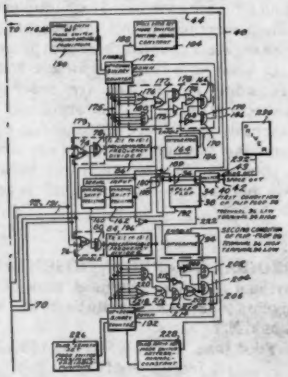
3,748,648

CONTROL MECHANISM FOR PRODUCING RANDOM-LIKE EFFECTS ON TEXTILE MATERIALS

Charles D. Pugh, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed July 1, 1971, Ser. No. 158,961
Int. Cl. G06f 1/02
U.S. Cl. 340—172.5 **37 Claims**





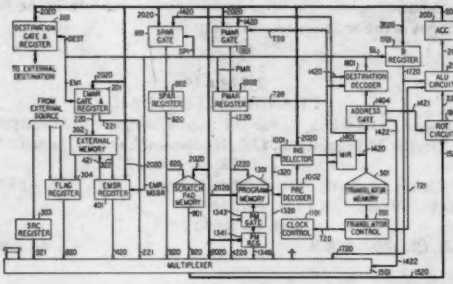
A novel circuit, having a number of novel subcombination thereof, for producing alternate on and off signals which can be used to control one or more clutches which, when activated, produce a slub on a yarn or thread or a space between slubs or for controlling any other suitable circuitry or equipment. This circuit produces an extremely long pseudo-random pattern of effect dispersion to give a true random-like appearance in cloth which is woven from such slub yarns or threads. The minimum length of the spaces and slubs can be independently set on switches which are manually accessible from the exterior of the device and also the ratio between minimum and maximum slub and space widths can be also set on other switches. The circuitry automatically causes the length of the slubs and spaces produced to vary within this range defined between the minimum and maximum values, choosing in a pseudo-random manner successive ones of a fixed number of divisions within that range. In the embodiment described below, that fixed number is 14 divisions between the minimum and maximum length of the slubs and spaces. The circuitry can further be caused to operate in a mode whereby the space or slub length remains constant and another mode in which each of the possible separations in the pseudo-random pattern is produced in succession but not necessarily in order. Similarly, the circuitry can be caused, by manual operation of a switch on the exterior of the device, to produce a slub or space of maximum or minimum length.

3,748,649

TRANSLATOR MEMORY DECODING ARRANGEMENT FOR A MICROPROGRAM CONTROLLED PROCESSOR

James Royce McEowen, Holmdel; David Clement Opferman, Red Bank, and Robert McKee Smith, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 29, 1972, Ser. No. 230,292
Int. Cl. G06f 9/12
U.S. Cl. 340—172.5 **21 Claims**



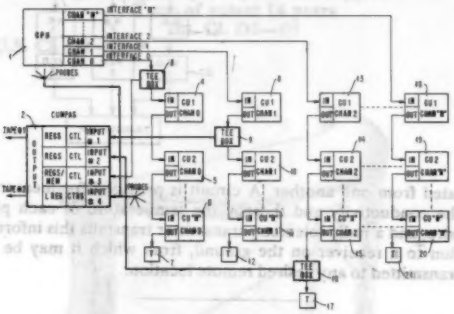
A microinstruction controlled minicomputer is arranged to perform processing functions either autonomously or in conjunction with a high level external memory. A dual bus scheme is utilized throughout the computer and all elements, such as memories and registers, have access to both buses for information transferal purposes. The controlling microinstructions are obtained from a first or program memory in sequential fashion and the OP code of each microinstruction specifies a particular word in a second or translation memory for decoding purposes. Each word of the second memory contains the number of bits necessary to control directly all of the functions of the machine. A multiphase clock is used to control the sequence of operation of the machine functions in conjunction with the various bits of the selected word of the translator memory. The processor is arranged to accept information from an external memory under control of a particular microinstruction and is arranged to jump to a new program memory microinstruction as directed, always remaining controlled by instructions decoded from the microinstruction supplied by the internal program memory.

3,748,650

INPUT/OUTPUT HARDWARE TRACE MONITOR

Leslie C. Garcia; John D. McNeill, both of Poughkeepsie; Theodore A. Papanastasiou, Hyde Park; Norman K. Powers, Wappingers Falls, and William E. Tjonpiangi, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,529
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 15 Claims



A hardware monitor capable of capturing information sent between a central processing unit and input/output devices. Captured information is time stamped and formatted with command control status, data transfer count and typical text information. The monitor contains a format storage medium which is segmented into N storage partitions. Each storage partition is unique insofar as it is associated with each I/O device. A one-for-one relationship reserves the Nth partition exclusively for the Nth I/O device and the partition has sufficient storage space to store the command control, status, time of day, internal control and typical text information relating to the Nth I/O device.

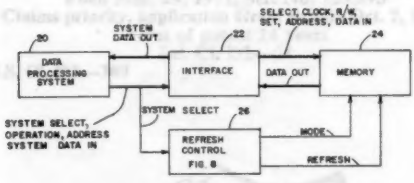
An operation initiated to or from the Nth I/O device causes time of day information to be stored in the time stamp position of the Nth partition. This time stamp furnishes exact information on when the I/O device operation was initiated. The type of operation associated with the Nth I/O device is captured by storing the actual command control and responding status information in their respective positions within the storage partition. In addition, the total transferred data to or from the I/O device is counted and this count value is stored with the control information.

3,748,651

REFRESH CONTROL FOR ADD-ON SEMICONDUCTOR MEMORY

Robert F. Mesnik, Yorktown Heights, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.

Filed Feb. 16, 1972, Ser. No. 226,665
Int. Cl. G11c *11/00*
U.S. Cl. 340—173 R 10 Claims



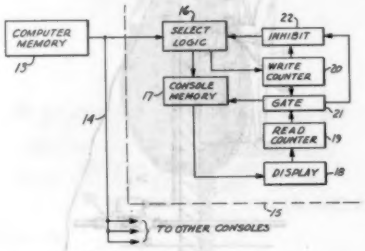
A circuit for controlling refresh operations of a dynamic MOS add-on memory. The need for a refresh operation is determined by a 4.5-microsecond clock. If the memory has not been selected in the recent past, in response to the clock signal a separate refresh cycle is initiated. If a read or write cycle is in progress when the clock signal is generated, a separate refresh cycle is executed a predetermined time after the termination of the read or write cycle. If a separate refresh operation is interrupted by a command to execute a read or write cycle, then the memory is operated in a mode in which it is automatically refreshed at the end of the read or write cycle.

3,748,652

DISPLAY BUFFER

Raymond W. Ward, Northridge, and Phillip W. Yows, Westlake Village, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 10, 1972, Ser. No. 242,525
Int. Cl. G11c *13/00*
U.S. Cl. 340—173 R 8 Claims



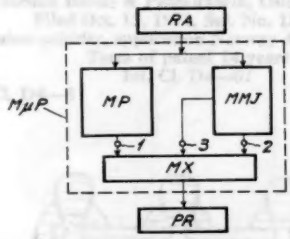
A display buffer is provided with a cyclic memory. Means is provided for writing data into the memory in successive regions and means is provided for reading data out in sequence. Counter means is provided to count the number of messages written into memory and the number of messages read out of memory, and inhibit means is provided to inhibit the write means if the memory becomes fully loaded. The read-out rate may be significantly different from the write-in rate so that the display buffer can accept data messages at a rate equal to computer assimilation and can display messages at a rate compatable to display rate generation.

3,748,653

MICROPROGRAM MEMORY FOR ELECTRONIC COMPUTERS

Guy Jules Achille Pierre Debruyne, Saint-Maur, and Jacques Michel Jean Bienvenu, Paris, both of France, assignors to Societe Industrielle Honeywell Bull (Societe anonyme), Paris, France

Filed Oct. 8, 1971, Ser. No. 187,717
Claims priority, application France, Oct. 16, 1970, 7037488
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 BB 9 Claims



A microprogram store having an updating store for holding substitute information elements for use with a fixed microprogram store of an electronic computer, such substitute information elements being replacements for corresponding errone-

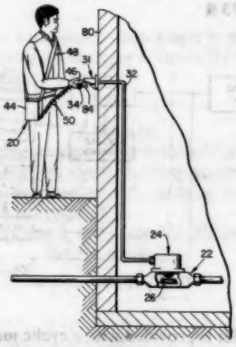
ous or missing information elements in the fixed store, wherein the updating store is an erasable store operated in parallel with the fixed store and supplying an information element held therein whenever an information element in the fixed store is addressed and a corresponding corrected information element is found in the erasable store.

3,748,654

REMOTE METER READ-OUT STATION WITH PULL-OFF COVER

Ray Sutherland, Hopwood, Pa., assignor to Rockwell Manufacturing Co., Pittsburgh, Pa.

Filed Jan. 21, 1972, Ser. No. 219,749
Int. Cl. G08c 19/02
U.S. Cl. 340—177 R **27 Claims**



A remote meter reading terminal housing having a terminal access opening that is closed by a removable cover. The cover is pulled off to provide access to the terminals in the housing by a magnet that is magnetically coupled to the cover by the meter reader.

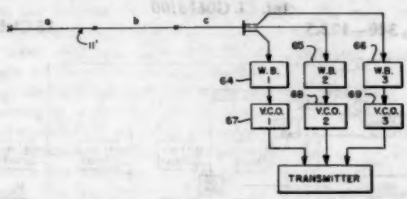
3,748,655

TEMPERATURE MONITORED CABLE SYSTEM WITH TELEMETRY READ-OUT

John Sherman Engelhardt, Hartsdale, and Lawrence Charles Ebel, Hastings-on-Hudson, both of N.Y., assignors to The Anaconda Company, New York, N.Y.

Division of Ser. No. 839,571, July 7, 1969, Pat. No. 3,633,191, which is a continuation-in-part of Ser. No. 580,762, Sept. 20, 1966, Pat. No. 3,491,597. This application June 17, 1971, Ser. No. 154,146
Int. Cl. G01k 7/16
U.S. Cl. 340—207 P **3 Claims**

In order to accurately and instantaneously measure the average temperatures of a plurality of intervals of a length of current carrying conductor such as a high-tension cable, a plurality of pilot wires each having a conductivity which varies according to its temperature is provided in thermal communication with corresponding intervals of the conductor along their common extents, so that the conductor and pilot wire are at essentially the same temperatures but are electrically insulated from one another. A circuit is provided for measuring the conductivity and thereby the temperature of each pilot wire, and a radio telemetry transmitter transmits this information to a receiver on the ground, from which it may be retransmitted to any desired remote location.

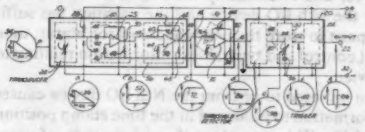


3,748,656

APPARATUS FOR MONITORING PRESSURE VARIATIONS IN A FLUID PRESSURE SYSTEM

Samuel A. Gray, Sun Valley, and Armando Perello, Northridge, both of Calif., assignors to Textron Inc.

Filed Nov. 8, 1971, Ser. No. 196,674
Int. Cl. G08b 21/00
U.S. Cl. 340—240 **13 Claims**

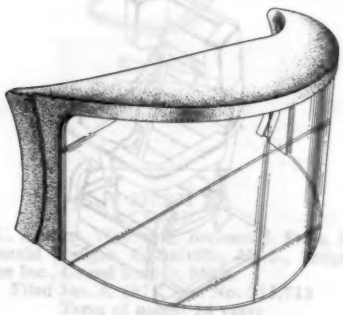


Pressure transducer means for sensing system pressure and providing a signal proportional thereto is connected to an electrical differentiator which provides an electrical signal which is proportional to the rate of change of system pressure. The rate of change of system pressure electrical signal is then compared to a predetermined reference signal to provide an output electrical signal only when the rate of change signal equals or exceeds the reference signal for a predetermined period of time. The output signal is utilized to actuate a device or sound a warning as may be required.

DESIGNS

JULY 24, 1973

227,819
FACE SHIELD
Nick Kotzar, Dover, Del., assignor to ILC Industries, Inc., Dover, Del.
Filed Mar. 22, 1971, Ser. No. 127,067
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233

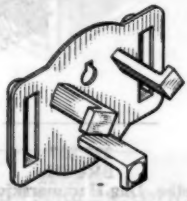


227,820
SPORTS SHOE
William J. Cohen, Boston, Mass., assignor to CITC Industries, Inc., New York, N.Y.
Filed Aug. 21, 1972, Ser. No. 282,052
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279

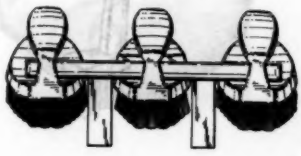
227,821
SPORTS SHOE
Aubrey Askew, Southport, England, assignor to Dunlop Holdings Limited, Birmingham, England
Filed Mar. 29, 1971, Ser. No. 129,293
Claims priority, application Great Britain Oct. 7, 1970
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

227,822
SPORTS SHOE
Aubrey Askew, Southport, England, assignor to Dunlop Holdings Limited, Birmingham, England
Filed Aug. 23, 1971, Ser. No. 174,312
Claims priority, application Great Britain Mar. 23, 1971
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

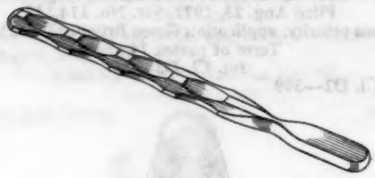
227,823
BELT ATTACHABLE TAPE HOLDER
Elvin L. Boyce, Salt Lake City, Utah, assignor to Tape-Licator, Inc., Salt Lake City, Utah
Filed June 17, 1971, Ser. No. 154,263
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



227,824
BRUSH UNIT
Baard Spydevoid, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed Oct. 15, 1971, Ser. No. 189,806
Claims priority, application Norway Aug. 30, 1971
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—8



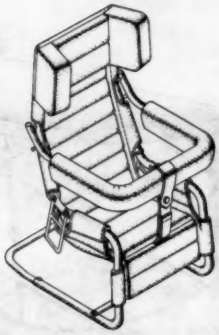
227,825
TOOTHBRUSH HANDLE
John L. Runckel, Lake Oswego, Oreg., assignor to Skyline Northwest Corporation
Filed Feb. 2, 1972, Ser. No. 223,057
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



227,826
BRUSH
Per Lindbo, Dag Hammarskjolds vei 35, Oslo 5, Norway
Filed June 24, 1971, Ser. No. 156,603
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31

227,827
BRUSH
Per Lindbo, Dag Hammarskjolds vei 35, Oslo 5, Norway
Filed June 24, 1971, Ser. No. 156,599
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31

227,828
CHILD'S CAR SEAT
Donald C. Heyl, 11 Via Seville, Rolling Hills Estates, Calif. 90274, and Harry R. Gillespie, 1200 S. Orange Grove, Apt. 16, Pasadena, Calif. 91105
Filed Oct. 18, 1971, Ser. No. 190,429
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



227,829
CHAIR WITH HEADREST OR SIMILAR ARTICLE
Odo Klose, Wuppertal-Elberfeld, Germany, assignor to Giroflex-Entwicklungs-AG, Koblenz, Switzerland
Filed June 7, 1971, Ser. No. 150,889
Claims priority, application Switzerland Dec. 8, 1970
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—31

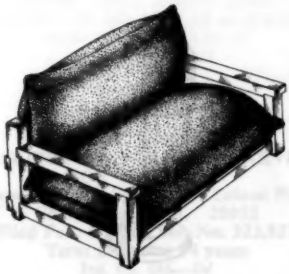
227,830
CHAIR OR SIMILAR ARTICLE
Odo Klose, Wuppertal-Elberfeld, Germany, assignor to Giroflex-Entwicklungs-AG, Koblenz, Switzerland
Filed June 7, 1971, Ser. No. 150,890
Claims priority, application Switzerland Dec. 8, 1970
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—31

227,831
CHAIR
William C. Andrus, Wyoming, Bernard J. Fries, Jenison, and Ronald Hodges, Grandville, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Jan. 5, 1972, Ser. No. 215,713
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—31

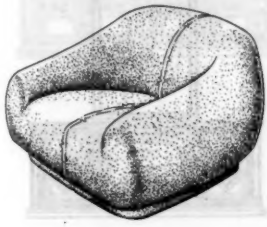
227,832
COMBINED CHAIR AND OTTOMAN
Gardner Leaver, East Hampton, N.Y., assignor to Steelcase Inc., Grand Rapids, Mich.
Continuation-in-part of design application Ser. No. 24,841, Sept. 4, 1970. This application Jan. 27, 1972, Ser. No. 221,483
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—37

227,833
PORTABLE STADIUM SEAT
Kenneth O. Olson, 12881 104A Avenue, Surrey, British Columbia, Canada
Filed May 14, 1971, Ser. No. 143,737
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—41

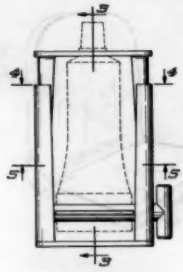
227,834
SOFA OR SIMILAR ARTICLE
William H. Oliver, 1219 N. 50th, Seattle, Wash. 98103
Filed Apr. 15, 1971, Ser. No. 134,531
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—63



227,835
CHAIR OR SIMILAR ARTICLE
Olaf Kuhlmann, Bad Pyrmont, Hann, Germany, assignor to Burris Manufacturing Company, Lincolnton, N.C.
Filed June 14, 1971, Ser. No. 153,127
Term of patent 7 years
Int. Cl. D6—*02*
U.S. Cl. D6—69



227,836
TUBE DISPENSER
Arve W. Roiko, 5536 N. Lilac Drive, Brooklyn Center, Minn. 55430
Filed Nov. 3, 1971, Ser. No. 195,539
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—87

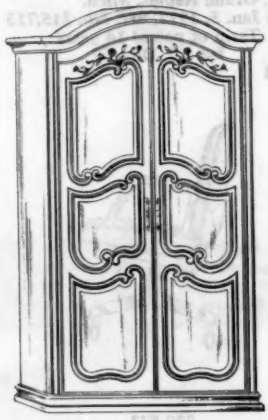


227,837
PASTE DISPENSER
Carl H. Reinhardt, Jr., N28 W26491 Lauderdale Drive, Pewaukee, Wis. 53072
Filed Jan. 11, 1972, Ser. No. 217,082
Term of patent 3½ years
Int. Cl. D6—*06*
U.S. Cl. D6—95

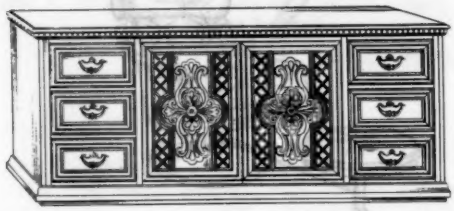
227,838
DRESSER WITH SCULPTURED LATTICE MOTIF OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,818
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

227,839
DRESSER WITH CARVED DETAILS OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,819
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

227,840
ARMOIRE WITH CARVED MOTIF OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,820
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

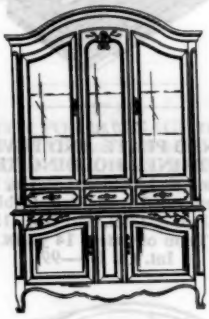


227,841
DRESSER WITH CARVED DOORS OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,821
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

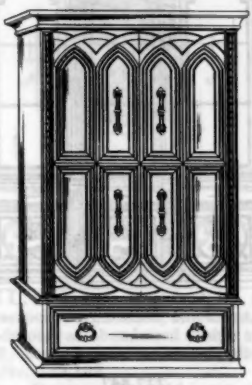


227,842
CHINA CABINET WITH CARVED DOORS OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,822
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

227,843
CHINA BREAKFRONT
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,824
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



227,844
FOUR DOOR CHEST
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,826
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

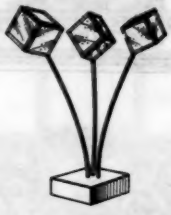


227,845
BREAKFRONT WITH DOOR CARVINGS OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,827
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

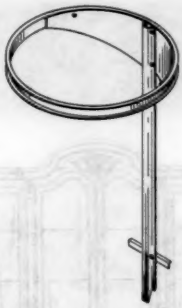
227,846
THREE DOOR BREAKFRONT OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Feb. 4, 1972, Ser. No. 223,828
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

227,847
BODY REST LOUNGE FOR SHAMPOOING
Beulah Molle, 2211 Santa Monica Blvd., Santa Monica, Calif. 90404
Filed Sept. 22, 1971, Ser. No. 182,923
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—200

227,848
COMBINED DISPLAY CUBE UNIT AND SUPPORT STAND THEREFOR
Marshall C. Schneider, 99 Ripley St., Newton Center, Mass. 01432
Filed May 26, 1971, Ser. No. 147,293
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

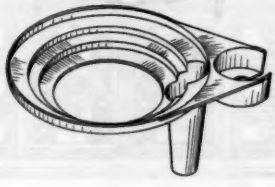


227,849
BAG SUPPORT
Robert R. Snoddy, 1517 Tulip Drive, Arlington, Tex. 76013
Filed Apr. 22, 1971, Ser. No. 136,640
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—189



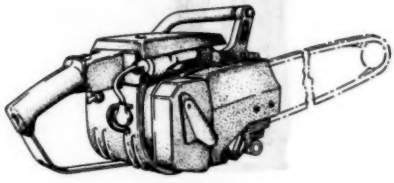
227,850
CAMP STOVE
Raymond E. Benson, 535 S. East Ave., Oak Park, Ill. 60304
Filed May 21, 1971, Ser. No. 145,993
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110

227,851
COMBINED PLATE AND BEVERAGE CONTAINER HOLDING TRAY
Frederick Nowland and Millicent Slevin, Dublin, Ireland, assignors to Graft-Un Limited, Dublin, Ireland
Filed Jan. 3, 1972, Ser. No. 215,290
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

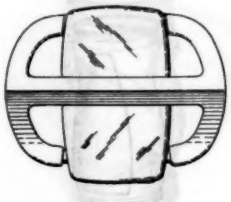


227,852
ROPE SPLICING SPIKE
James D. McGrew, 8120 Rio Linda Blvd., Elverta, Calif. 95626
Filed Oct. 29, 1971, Ser. No. 194,084
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

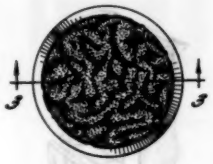
227,853
POWER CHAIN SAW ENGINE ASSEMBLY
Ulrich O. Densow and David L. Dickson, Peterborough, Ontario, Canada, assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 12, 1971, Ser. No. 115,149
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—65



227,854
DRAW CATCH FOR LUGGAGE OR THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Co., Inc., Garfield, N.J.
Filed Sept. 14, 1971, Ser. No. 180,534
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—129



227,855
HARDWARE FOR CABINETS
Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed July 1, 1971, Ser. No. 159,078
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—144



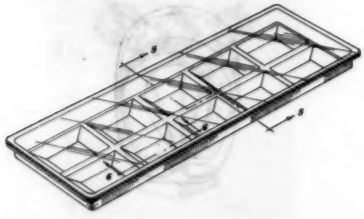
227,856
ESCUTCHEON
Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Continuation-in-part of abandoned design application Ser. No. 24,610, Aug. 20, 1970. This application June 1, 1971, Ser. No. 149,109
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—187

227,857
THIMBLE FOR A ROPE
Harvey F. Dorval, Roxboro, Quebec, Canada, assignor to Martin-Black Wire Ropes of Canada Ltd., Pointe Claire, Quebec, Canada
Filed Oct. 21, 1971, Ser. No. 191,574
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

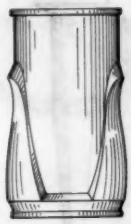
227,858
VALVE BRACKET
Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, N.Y., assignors to Penn-Plax Plastics, Inc., Jamaica, N.Y.
Filed Jan. 6, 1972, Ser. No. 215,757
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

227,859
RAZOR HOLDER
Norman D. Poisson, Marblehead, Mass., assignor to The Gillette Company, Boston, Mass.
Filed May 17, 1971, Ser. No. 144,377
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186

227,860
COMBINED MOLD AND PACKING TRAY FOR CONFECTIONARY
Robert W. Schumann, 15765 Vernon Drive, Brookfield, Wis.
Filed June 28, 1971, Ser. No. 157,793
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187



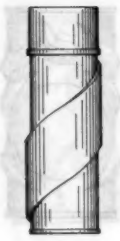
227,861
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed June 19, 1972, Ser. No. 264,113
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



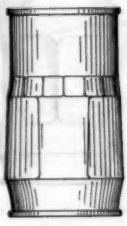
227,862
CAN OR SIMILAR ARTICLE
Carmen T. Mascia, Westmont, and Richard B. Bagguley, Dolton, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 10, 1972, Ser. No. 216,902
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

227,863
CAN OR SIMILAR ARTICLE
Carmen T. Mascia, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Continuation-in-part of abandoned design application Ser. No. 21,843, Mar. 11, 1970. This application Apr. 12, 1971, Ser. No. 133,486
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

227,864
CAN OR SIMILAR ARTICLE
Richard B. Bagguley, Orland Park, and Carmen T. Mascia, Westmont, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 12, 1972, Ser. No. 243,544
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

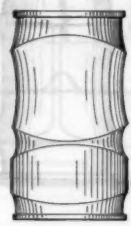


227,865
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,034
Claims priority, application Japan Nov. 9, 1971
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

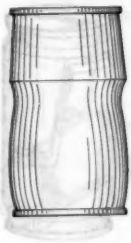


227,866
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,037
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

227,867
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,038
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

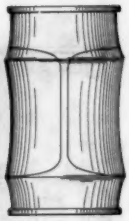


227,868
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,040
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

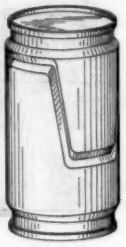


227,869
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,041
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

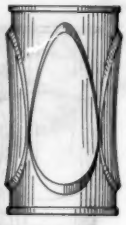
227,870
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,043
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



227,871
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,045
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

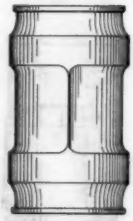


227,872
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,046
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



227,873
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed June 19, 1972, Ser. No. 264,112
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

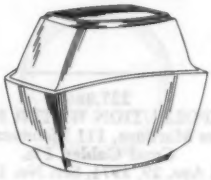
227,874
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,044
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



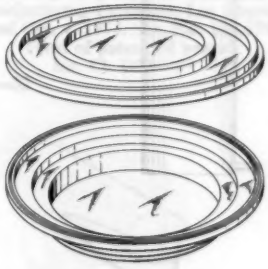
227,875
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed June 19, 1972, Ser. No. 264,111
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

227,876
CAN OR SIMILAR ARTICLE
Thomas R. Stanley, Downers Grove, and Dexter M. Bystedt, Clarendon Hills, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 17, 1972, Ser. No. 245,036
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222

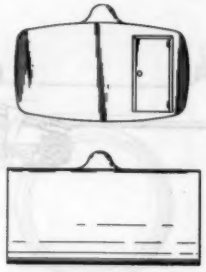
227,877
DISPLAY CASE
Thomas Howe Hayes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Mar. 10, 1971, Ser. No. 123,114
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—233



227,878
CONTAINER FOR PIZZA OR THE LIKE
George E. Meyer, 217 S. Knott, Anaheim, Calif. 92804
Filed May 17, 1971, Ser. No. 144,353
Term of patent 7 years
Int. Cl. D9—*03*
U.S. Cl. D9—237

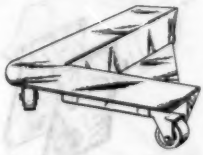


227,879
MODULAR HOUSING UNIT
Donald W. Modarelli, Jr., 908–A Peachtree Road, Claymont, Del. 19703
Filed Sept. 13, 1971, Ser. No. 180,254
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

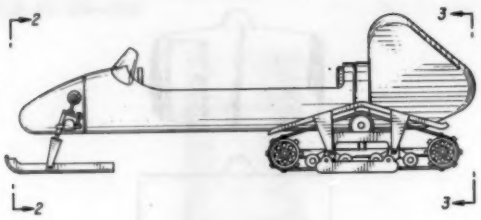


227,880
TRASH CAN CART
Ernest F. Steinhoff, Freeport, Ill., and Neal K. Steinhoff, Verona, Wis. (both % The Steinhoff Company, Rte. 1, Verona, Wis. 53593)
Filed July 28, 1971, Ser. No. 167,072
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3 M

227,881
HEAVY EQUIPMENT DOLLY
Earl Fox, Torrance, Calif., assignor of a fractional part interest to August A. Pfaehler, Manhattan Beach, Los Angeles, Calif.
Filed May 21, 1971, Ser. No. 145,998
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D14—3 N



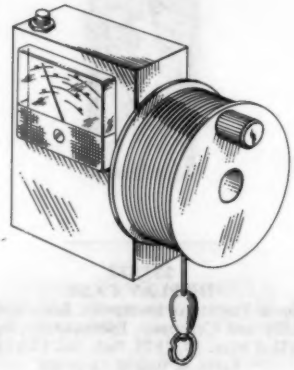
227,882
SELF-PROPELLED SNOW VEHICLE
Verril E. Williams, 4923 Escobedo Drive, Woodland Hills, Calif. 91364
Filed Oct. 12, 1971, Ser. No. 188,649
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—24



227,883
COMBINED PUMP HANDLE AND LOCKING UNIT FOR FIRE EXTINGUISHERS
Charles K. Huthsing, Jr., Libertyville, Ill.; N. Evelyn Huthsing, executor of the estate of Charles K. Huthsing, Jr., deceased
Filed Aug. 11, 1970, Ser. No. 24,420
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D16—2 A

227,884
PAIR OF STOCKS FOR SMALL CALIBER SEMI-AUTOMATIC PISTOLS
Henry R. Howlett, Cicero, Ill. (R.F.D. 3, Churubusco, Ind. 46723)
Filed Sept. 14, 1971, Ser. No. 180,533
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

227,885
FISH LOCATOR
Vernon C. Gambrell, 204 W. Mill St., Horseheads, N.Y. 14845
Filed Feb. 8, 1971, Ser. No. 113,784
Term of patent 3½ years
Int. Cl. D22—*99*
U.S. Cl. D22



227,886
ANTIPOLLUTION WATER FILTER
Carlos Martinez, 111 Mendoza Ave., Coral Gables, Fla.
Filed Apr. 29, 1971, Ser. No. 138,852
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

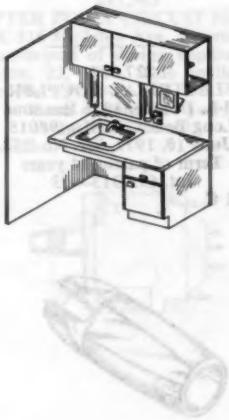
227,887
METER PIT
Harold E. Cosson, Sheboygan, Wis., assignor to Ametek, Inc., Sheboygan, Wis.
Filed June 9, 1971, Ser. No. 151,628
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

227,888
TAPERED GUIDE TIP FOR PIPE CONNECTIONS
Webster Felix, 1 Casa Court, Central Islip, N.Y. 11722
Filed Apr. 30, 1971, Ser. No. 139,302
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41

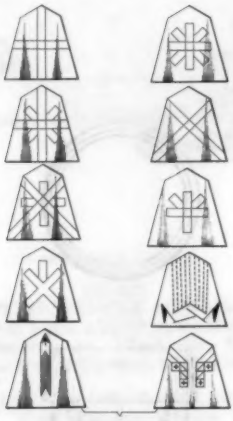
227,889
SPOUT
Jack Rauh, Hacienda Heights, Calif., assignor to Modern Faucet Manufacturing Company, Los Angeles, Calif.
Filed Oct. 4, 1971, Ser. No. 186,579
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

227,890
SLOTTED GUIDE TIP FOR PIPE CONNECTIONS
Webster Felix, 1 Casa Court, Central Islip, N.Y. 11722
Filed May 6, 1971, Ser. No. 141,091
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41

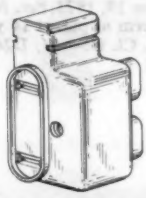
227,891
DENTAL CABINET MODULE
Robert G. Welsh, 4239 Redick, Omaha, Nebr. 68111
Filed June 19, 1972, Ser. No. 264,267
Term of patent 14 years
Int. Cl. D6—*01*; D24—*03*
U.S. Cl. D24—1 B



227,892
SET OF MARKERS FOR AN EDUCATIONAL AID
Anthony C. Cozzetti, Las Vegas, Nev.
(16203 SE. 29th Place, Bellevue, Wash. 98008)
Filed May 19, 1971, Ser. No. 145,098
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R

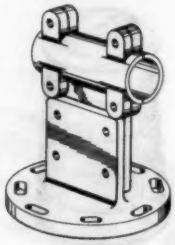


227,893
ELECTRICAL RECEPTACLE
Peter M. Schmidt, Decatur, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed June 2, 1971, Ser. No. 149,414
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B



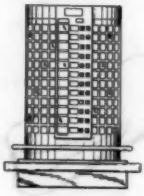
227,894
ELECTRICAL COUPLER
Richard L. Double, 1926 Roxanne Ave., Long Beach, Calif. 98015
Filed June 10, 1971, Ser. No. 152,015
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 C

227,895
CONNECTOR
Edward Price McLean, Jr., Moultrie, Ga., assignor to Ampersand, Inc., Moultrie, Ga.
Filed July 2, 1971, Ser. No. 159,029
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 C

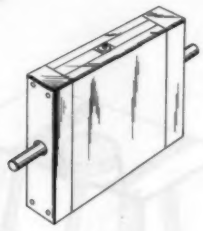


227,896
INTER-DENTAL FLOSSING DEVICE
Ingram S. Chodorow, 100 E. Hartsdale Ave., Hartsdale, N.Y. 10530
Filed May 17, 1972, Ser. No. 254,345
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

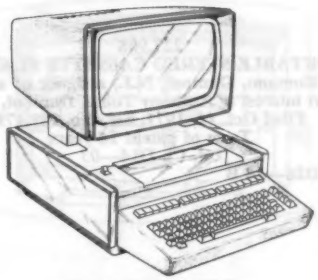
227,897
COMBINED SELECTION CONSOLE AND DISPLAY
Samuel Lubkin, Lauderdale Lake, Fla., assignor to Electronic Systems Division, a division of Dynamics Corporation of America, Boynton Beach, Fla.
Filed July 2, 1971, Ser. No. 159,581
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



227,898
ELECTRIC MOTOR
Robert Page Burr and Raymond J. Keogh, Huntington, N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.
Filed Jan. 11, 1972, Ser. No. 217,081
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A

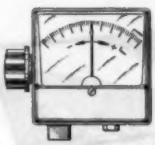


227,899
DATA COMMUNICATIONS UNIT
Donald M. Genaro, Haworth, N.J., Arthur A. Hagstrom, Hoffman Estates, Ill., and Gordon Sylvester, Jamaica, N.Y., assignors to Teletype Corporation, Skokie, Ill.
Filed Jan. 17, 1972, Ser. No. 218,664
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



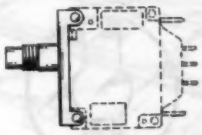
227,900
ELECTRONIC CONTROL CONSOLE
Anthony P. H. Chan, Los Altos Hills, and Hugh John Hall, Los Altos, Calif., assignors to Syntex Corporation, Apartado, Panama
Filed Aug. 16, 1972, Ser. No. 281,197
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

227,901
ELECTROSTATIC FIELD INDICATOR
Chester D. Slocum, Jr., 9860 SW. 40th St., Miami, Fla. 33165
Filed Aug. 4, 1971, Ser. No. 169,168
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1 Q



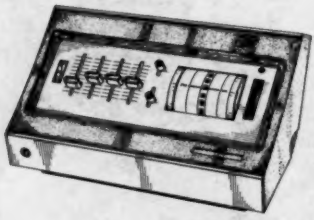
227,902
INDOOR ANTENNA OR SIMILAR ARTICLE
John David Callaghan, Cherry Hill, N.J., and Raymond Kaysen, Glenside, Pa., assignors to RCA Corporation
Filed Aug. 16, 1971, Ser. No. 172,360
Claims priority, application Great Britain May 20, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

227,903
ADAPTER FOR A CIRCUIT BREAKER
Ronald Nicol, 316 McAdoo Ave., Trenton, N.J. 08619
Continuation-in-part of design application Ser. No. 21,039, Jan. 22, 1970. This application July 1, 1971, Ser. No. 159,104
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D26—13



227,904
SPEAKER HOUSING
Ryoichi Takeoka, Tokyo, and Sakae Nakamoto, Kobe, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 9, 1971, Ser. No. 179,273
Claims priority, application Japan Mar. 19, 1971
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

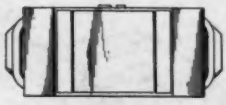
227,905
AMPLIFIER
Ryoichi Takeoka, Tokyo, and Sakae Nakamoto, Kobe, Japan, assignors to Mitsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 9, 1971, Ser. No. 179,276
Term of patent 14 years
Int. Cl. D14—*04*
U.S. Cl. D26—14 L



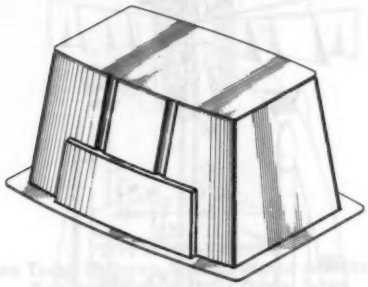
227,906
REEL FOR TAPE OR THE LIKE
Horace T. Montgomery, Mission Viejo, and Hormoz Rafaat, Corona del Mar, Calif., assignors to Memorex Corporation, Santa Clara, Calif.
Filed June 11, 1971, Ser. No. 152,472
Term of patent 14 years
Int. Cl. D14—*01*; D16—*03*
U.S. Cl. D26—14 B

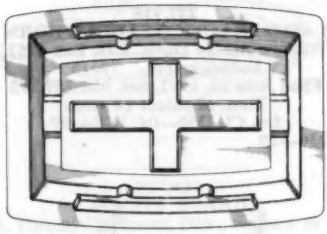
227,907
MICROPHONE GRILLE
Andrew Kainass, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Jan. 14, 1972, Ser. No. 218,041
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14 G

227,908
PORTABLE STEREO CASSETTE PLAYER
Michael Romano, Dumont, N.J., assignor of a fractional part interest to Anthony Tobia, Dumont, N.J.
Filed Oct. 14, 1971, Ser. No. 189,479
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 B

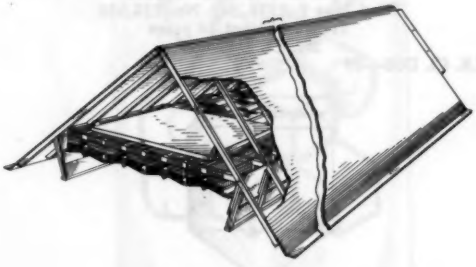


227,909
ENCLOSURE FOR TRANSFORMERS AND OTHER ELECTRICAL UTILITY APPARATUS
Roy Griffing, 485 N. State Highway, Lake Arrowhead, Calif. 92352
Filed May 28, 1971, Ser. No. 148,298
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15

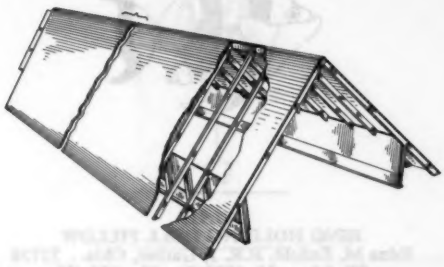




227,910
POULTRY HOUSE
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed May 14, 1971, Ser. No. 143,734
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

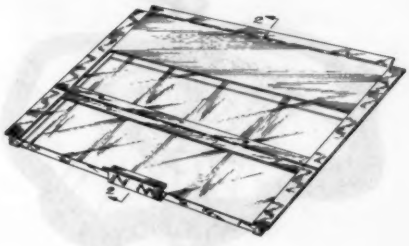


227,911
POULTRY HOUSE
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed May 17, 1971, Ser. No. 144,374
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



227,912
POULTRY HOUSING COMPLEX
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed June 1, 1971, Ser. No. 149,094
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

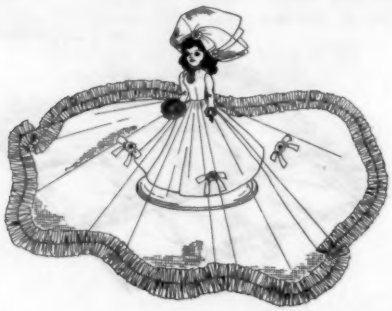
227,913
AQUARIUM CANOPY
Gerald R. Ritzow, Racine, and Roger C. Ritzow, Milwaukee, Wis., assignors to All-Glass Aquarium Co., Inc., Cudahy, Wis.
Filed Aug. 13, 1971, Ser. No. 171,786
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



227,914
TROPICAL FISH TOY
Seiji Asano, 27–23, 2-chome, Sumida, Sumida-ku, Tokyo, Japan
Filed Oct. 20, 1971, Ser. No. 191,139
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 C

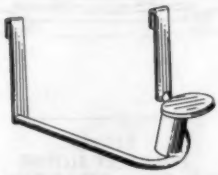
227,915
RING HOLDING DOLL PILLOW
Edna M. Enfield, R.R. 1, Garber, Okla. 73738
Filed June 21, 1971, Ser. No. 155,408
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

227,916
BRIDE DOLL
Edna M. Enfield, R.R. 1, Garber, Okla. 73738
Filed June 21, 1971, Ser. No. 155,388
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



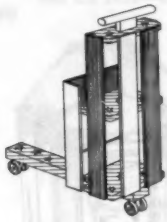
227,917
CAROUSEL
Wolfgang Langheinrich, 4471 Ventura Canyon, D–201, Sherman Oaks, Calif. 91403
Filed Aug. 27, 1971, Ser. No. 175,808
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 Q

227,918
LASSO PRACTICE SADDLE HORN
Wilburn Ashley Davis, P.O. Box 6752, Lubbock, Tex. 79413
Filed June 28, 1971, Ser. No. 157,792
Term of patent 14 years
Int. Cl. D30—*04;* D21—*99*
U.S. Cl. D30—19

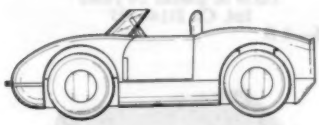


227,919
DISPOSER CANISTER FOR PET DROPPINGS
Paul W. Howard, Jr., 10660 Stanford Ave., Garden Grove, Calif. 92640
Filed June 9, 1971, Ser. No. 151,606
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

227,920
SCOOTER
Adam Cirgenski, Jr., 7705 Secor Road, Lambertville, Mich. 48144
Filed June 1, 1971, Ser. No. 149,105
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AT



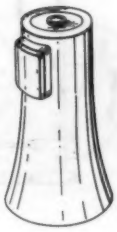
227,921
TOY AUTOMOBILE
Ichiro Tachi, Fujisawa, Japan, assignor to Kabushiki Kaisha Asakusa Ganzu, Tokyo, Japan
Filed May 9, 1972, Ser. No. 251,859
Claims priority, application Japan Nov. 18, 1971
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



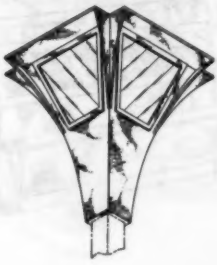
227,922
PUZZLE BOARD
Judy A. Cohen, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc.
Filed Aug. 20, 1971, Ser. No. 173,719
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

227,923
SANTA CLAUS HEAD WITH MOVABLE EYELIDS
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Jan. 11, 1971, Ser. No. 105,755
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 B

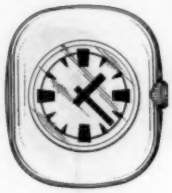
227,924
CIGARETTE LIGHTER
Kenjiro Goto, 28–13, 5-chome, Sakurajosui, Setagaya-ku, Tokyo, Japan
Filed Dec. 27, 1971, Ser. No. 212,849
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R



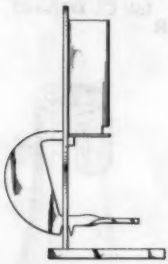
227,925
AREA LIGHTING LUMINAIRE
Donald E. Husby, Fairview Park, and Clem W. Eberhart, Elyria, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 20, 1972, Ser. No. 246,101
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



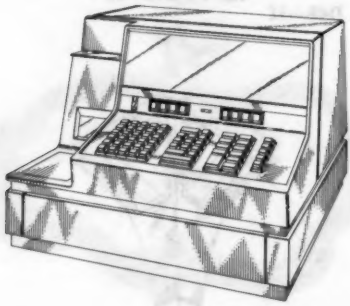
227,926
WATCH
Timothy Kohler, Tramelan, Switzerland, assignor to Trifari, Krussman & Fishel, Inc., New York, N.Y.
Filed Aug. 8, 1972, Ser. No. 278,785
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8 R



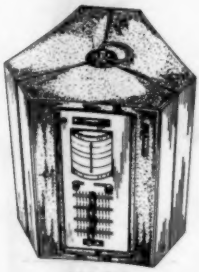
227,927
DOG BISCUIT DISPENSER
Gerald E. Gaus, 4535 S. Layton, Anderson, Ind. 46011
Filed Nov. 10, 1971, Ser. No. 197,640
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D52—2 B



227,928
CASH REGISTER OR SIMILAR ARTICLE
Donald L. Forsythe, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Apr. 9, 1971, Ser. No. 132,933
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4

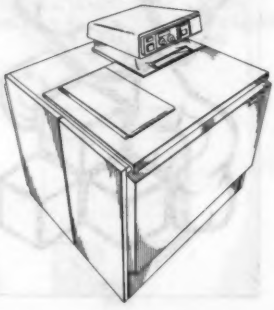


227,929
RADIO RECEIVER
Ryoichi Takeoka, Tokyo, and Sakae Nakamoto, Kobe, Hyogo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 9, 1971, Ser. No. 179,274
Claims priority, application Japan Mar 19, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



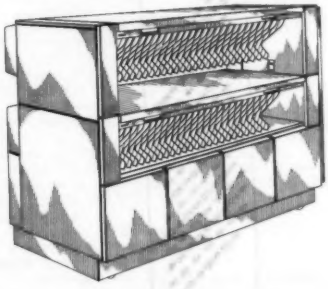
227,930
RADIO RECEIVER
Kikuo Ota, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 9, 1971, Ser. No. 179,275
Claims priority, application Japan Mar. 19, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

227,931
ELECTROPHOTOGRAPHIC PRINTING MACHINE
William F. Dalton, Pittsford, Claude Hutcheson, Fairport, and Ruediger W. Knodt, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed July 10, 1972, Ser. No. 270,413
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

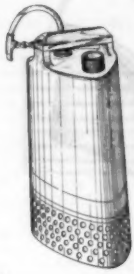


227,932
COMBINED LABEL PRINTER AND APPLICATOR
Robert P. Mulholland, Centerville, Paul H. Hamisch, Jr., Franklin, and William A. Jenkins, Englewood, Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Jan. 26, 1972, Ser. No. 221,131
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—10

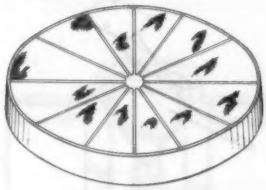
227,933
SORTER FOR A DUPLICATING MACHINE OR THE LIKE
Stephen K. Bright, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 27, 1971, Ser. No. 147,722
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 B



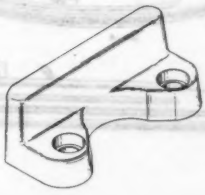
227,934
PUMP
Jerry L. Campbell, 7399 Claret Circle, Salt Lake City, Utah 84121, and Farral D. Gay, Jr., 6843 South 2850 West, West Jordan, Utah 84084
Filed Nov. 26, 1971, Ser. No. 202,737
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R



227,935
RAFT
Ervin J. Keller, G–4382 Lippincott, Flint, Mich. 48507
Continuation-in-part of abandoned design application Ser. No. 17,125, May 12, 1969. This application Jan. 29, 1970, Ser. No. 21,145
Term of patent 14 years
Int. Cl. D21—*99*
U.S. Cl. D71—1 HH



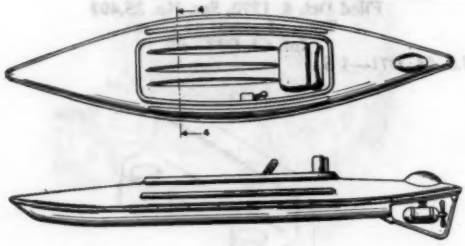
227,936
ANODE FOR MARINE USE
Robert C. Kucher, Seattle, Wash., assignor to Rendell Tractor & Equipment Company, Ltd., Vancouver, British Columbia, Canada
Filed Oct. 8, 1970, Ser. No. 25,402
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D71—1 S



227,937
WEIGHT FOR DIVERS
Leopold J. Coers, Jr., Wichita, Kans. (Startzville, Tex. 78130)
Filed Nov. 20, 1970, Ser. No. 26,094
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D71—1 FF

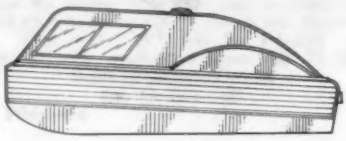
227,938
AERODYNAMIC PRESSURE PROBE
Richard V. De Leo, Hopkins, and Floyd W. Hagen, Eden Prairie, Minn., assignors to Rosemont Inc., Eden Prairie, Minn.
Filed Mar. 8, 1971, Ser. No. 122,286
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D71—1 D

227,939
BOAT
B. J. Robbins, P.O. Box 567, Marshall, Tex. 75670; Sanford L. Patterson, 3225 Autumn Lane, Shreveport, La. 71109; and Raymond W. Spencer, 600 Lynoak, Marshall, Tex. 75670
Filed Mar. 18, 1971, Ser. No. 125,913
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q



227,940
CARBURETOR PASSAGE PLUG
Vernon F. Thompson, Crestwood, Mo., assignor to Tomco, Inc., St. Louis County, Mo.
Filed Apr. 29, 1971, Ser. No. 138,856
Term of patent 14 years
Int. Cl. D15—*01, 99*
U.S. Cl. D77—1 A

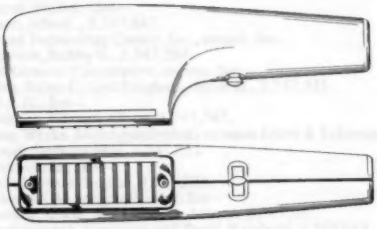
227,941
RECREATIONAL VEHICLE
Erdis L. Smith, 110 Wesley Drive NW., Cedar Rapids, Iowa 52405
Filed June 9, 1971, Ser. No. 151,633
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 V



227,942
STERILIZATION INDICATOR TAPE
Arthur W. Kelson, New York, N.Y., assignor to Propper Manufacturing Co. Inc.
Filed Apr. 15, 1971, Ser. No. 134,521
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 W

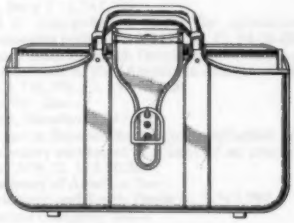
227,943
EYE SURGICAL TOOL
Ely Jay Crary, Marietta, Ga.
(4730 Austell Road, Austell, Ga. 30001)
Filed Apr. 5, 1971, Ser. No. 131,571
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

227,944
PORTABLE HAIR DRYER
James Edgar Tucker, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Jan. 21, 1972, Ser. No. 219,923
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



227,945
LADIES PURSE
Gertrude B. Hirtz, 420 Monroe Ave., Campbell, Mo. 63933
Filed June 28, 1971, Ser. No. 157,802
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

227,946
LUGGAGE CASE
Kenneth A. Milette, Laguna Beach, Calif., assignor to Design West Incorporated, Irvine, Calif.
Filed Apr. 26, 1971, Ser. No. 137,733
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JULY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. & A. Engineering Co.: *See—*
Baldwin, Richard N., 3,748,427.
A/S Moelven Brug: *See—*
Kollandsrud, Per, 3,747,694.
AB Volvo Penta: *See—*
Kjellberg, Knut Janne, 3,747,556.
Abbott Laboratories: *See—*
Liston, Max D., 3,748,044.
Pearson, Whitney Lombard; Banford, John Alexander; and Szymanski, Earl Thaddeus, 3,748,209.
Abelman, Hershel. Beach structure. 3,748,012, Cl. 312-440.000.
Abrams, Albert, to Shell Oil Company. Increasing injectivity by dilute alcohol injection. 3,747,680, Cl. 166-305.00r.
Ackeret, Peter, to Provalor A.G. Money box. 3,747,838, Cl. 232-4.000.
Ackermann, Karl, to Bosch, Robert, Photokino G.m.b.H. Automatically terminating battery charging arrangement with means for decreasing ripple effect. 3,748,568, Cl. 320-31.000.
Acme-Cleveland Corporation: *See—*
Schubert, Karl P., 3,747,444.
Adams, James C., Jr.: *See—*
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.
Adams, Jerry. Artificial holder for a floral accessory. 3,747,269, Cl. 47-55.000.
Adams, Richard C., to Schjeldahl, G. T., Company. Method and apparatus for making a profile bag structure. 3,748,205, Cl. 156-252.000.
Adamski, Raymond. Hinge. 3,747,271, Cl. 49-340.000.
Addressograph-Multigraph Corporaton: *See—*
Margulis, Harry; and Korff, Roy D., 3,747,918.
Adhav, Patan Shankar. Cesium dideuterium arsenate crystallization process and solution. 3,748,102, Cl. 23-301.00r.
Adler, Barry G. Cervical dilators. 3,747,603, Cl. 128-341.000.
Adlum, Lawrence G.: *See—*
Winkler, Joseph; Bredbenner, Charles W.; and Adlum, Lawrence G., 3,748,288.
Advanced Air, Inc.: *See—*
Kurz, John C., 3,747,662.
Advanced Technology Center, Inc., mesne: *See—*
Beavers, Bobby R., 3,747,204.
Aerojet-General Corporation, mesne: *See—*
Ulm, Reign C.; and Kinghorn, Mark D., 3,747,381.
Aerpat A.G.: *See—*
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Aesculap Werke Aktiengesellschaft vormals Jetter & Scheerer: *See—*
Krayl, Gerhard Max, 3,747,212.
AGA Aktiebolag: *See—*
Scholdstrom, Ragnar, 3,748,026.
Agfa-Gevaert Aktiengesellschaft: *See—*
Becker, Erwin; and Putscher, Johann, 3,747,491.
Bestenreiner, Friedrich; and Deml, Reinhold, 3,748,019.
Kulterer, Reinhard; Moll, Adolf; and Hofmann, Wilfried, 3,748,037.
Wick, Richard; Winkler, Alfred; and Kukuk, Wilhelm, 3,747,498.
Agfa-Gevaert N.V.: *See—*
De Cock, Etienne Marie, 3,748,482.
Willems, Josef Frans, 3,748,136.
Agfa-Gevaert N.V., mesne: *See—*
Maffet, Vere; and Remesat, Armin C., 3,747,525.
Agnew, James Malcolm; French, Albert Graham; and Tate, David Arthur, to Coal Industry (Patents) Limited. Rotary cutters for mineral mining. 3,747,982, Cl. 299-81.000.
Agusa, Kazuo; and Akahide, Kozo, to Kawasaki Steel Corporation. Multiple-wire single-pass submerged-arc welding method for thick plates. 3,748,429, Cl. 219-73.000.
Airco, Inc.: *See—*
Andresen, Sigurd, 3,748,536.
Tsujimoto, Kazumi N., 3,748,365.
Akahide, Kozo: *See—*
Agusa, Kazuo; and Akahide, Kozo, 3,748,429.
Akamatsu, Takashi; and Kuwahara, Yukio, to Sumitomo Chemical Company, Limited. Novel pigmentation method for organic pigments. 3,748,164, Cl. 106-288.00q.
Akamu, Walter, to Deep sea fishing. . 3,747,881, Cl. 248-42.000.
Akcona Incorporated: *See—*
Klementz, Peter; Nitschke, Christoph; and Haubold, Herbert, 3,747,863.
Aktiengesellschaft des Altenbergs fur Bergbau und Zinkhuttenbetrieb: *See—*
Kalthoff, Carl-Heinz; Freis, Wilhelm; and Wilczynski, Peter, 3,747,757.
Akzona Incorporated: *See—*
Zang, Thomas; and Leeb, Alfons, 3,747,227.
Alarm Device Manufacturing Company: *See—*
Guthart, Leo A., 3,748,610.
Alberto, Vicente S., to Union Carbide Corporation. Galvanic cell having improved construction. 3,748,181, Cl. 136-107.000.
Aldinger, Ulrich, to Bosch, Robert, G.m.b.H. Variable volume hydraulic apparatus. 3,747,477, Cl. 91-497.000.
Alexander, Thomas F., to Hughes Aircraft Company. Ballistic trajectory computer. 3,748,440, Cl. 235-61.50r.
Alexeev, Kirill M., 50% to Gourevtich, Jacques. Variable speed reducer. 3,747,424, Cl. 74-425.500.
Alinder, Gilbert L.: *See—*
Anderson, Lloyd E.; and Alinder, Gilbert L., 3,747,169.
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Ramachandran, Sundaresan, 3,748,122.
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Allen, Rudolph. Combination chock and fairlead fitting. 3,747,554, Cl. 114-218.000.
Allied Chemical Corporation: *See—*
Bean, Samuel L.; and Montone, Anthony W., 3,748,103.
Khattab, Ghazi, 3,748,306.
Schevey, William R., 3,748,236.
Wooster, George Sidney; and Kirss, Voldemar, 3,748,315.
Wulbrecht, Robert M., 3,748,477.
Allison, David F., to Signetics Corporation. Photosensitive device and array. 3,748,546, Cl. 317-235.00r.
Allmanna Svenska Elektriska Aktiebolaget: *See—*
Nilsson, Jan; Syvakari, Pertti; and Westman, Erik, 3,747,383.
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Alloy Products Corporation: *See—*
Atkinson, Jerry T., 3,747,799.
Alms, Erhard E. Anti-pollution screen for agricultural dryer and method of removing pollutants. 3,747,225, Cl. 34-26.000.
Alon, Yosef, to Yissum Research Development Company and Hebrew University of Jerusalem, The. Amplitude stabilizer for magnetic field modulators. 3,748,599, Cl. 332-39.000.
Alpha Designs, Inc.: *See—*
Uroshevich, Miroslav, 3,747,802.
Altmann, Werner, to Daimler-Benz Aktiengesellschaft. Mechanism for producing a rotary movement in a valve of an internal combustion engine. 3,747,579, Cl. 123-90.300.
Aluminum Company of America: *See—*
Gayner, Herbert; and Smith, David A., 3,747,797.
Amaco Production Company: *See—*
Martiner, Samuel T., 3,748,570.
Amann, William Leon: *See—*
Lewis, Karl D.; Hasselwander, Ray W.; and Amann, William Leon, 3,747,811.
American Air Filter Company, Inc.: *See—*
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Jackson, Robert L., 3,747,773.
O'Dell, Leonard J.; and Hamilton, William R., Jr., 3,747,305.
American Cyanamid Company: *See—*
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American Flange & Manufacturing Co., Inc.: *See—*
Greck, Eugene, 3,747,738.
American Home Products Corporation: *See—*
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American Homes Products Corporation: *See—*
Santilli, Arthur A.; and Kim, Dong H., 3,748,352.
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Turko, Michael, 3,747,505.
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American Optical Corporation: *See—*
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American Seating Company: *See—*
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Crabb, William A.; and Flynn, James L., 3,748,512.

Amidon, Alan B.; and Mammino, Joseph, to Xerox Corporation. Treatment of reusable photoconductive surfaces with Lewis acids or bases. 3,748,127, Cl. 96-1.0ly.

Ammco Tools, Inc.: *See—*
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Amoco Production Company: *See—*
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AMP Incorporated: *See—*
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Amsted Industries Incorporated: *See—*
Neumann, Otto Walter; and Davis, Louis Dean, 3,748,001.

Amtsberg, Lester A.; and Wallace, William K., to Chicago Pneumatic Tool Company. Pneumatic tool having combined nut running and crimping. 3,747,441, Cl. 81-10.000.

Anaconda American Brass Company: *See—*
Case, Oliver P.; Jones, Ronald B. L.; Spellman, Robert D.; and Archambalut, Joseph W., 3,748,124.

Anaconda Company, The, mesne: *See—*
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Andersen, James M.: *See—*
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Anderson, A. D.; Lauridsen, Walter E.; and Overstreet, Charles L., to Iowa Beef Processors, Inc. Method for breaking animal carcasses and handling meat products. 3,748,146, Cl. 99-107.000.

Anderson, Carlo E., to Chevron Research Company. Ship's cargo tank cleaner. 3,747,854, Cl. 239-227.000.

Anderson, Charles H., to Pennsylvania Engineering Corporation. Method and apparatus for uncoiling heated coils of steel bar for hot rolling. 3,747,908, Cl. 266-1.00r.

Anderson, Irvin O., Jr.: *See—*
Craig, Burnie M.; and Anderson, Irvin O., Jr., 3,747,158.

Anderson, James H. Night stream cooling system and method. 3,747,907, Cl. 261-128.000.

Anderson, Lloyd E.; and Alinder, Gilbert L. Spring fastener. 3,747,169, Cl. 24-237.000.

Anderson, Todd G.; and Ing, Donald Y., to Motorola, Inc. Portable radio with integral acoustical horn. 3,748,583, Cl. 325-353.000.

Anderson, Wilfred King: *See—*
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.

Andersson, Karl Ivan. Adjustable tool holder. 3,747,180, Cl. 29-97.500.

Andersson, Lennart Valentin, to Mediada AB. Anaesthetic apparatus. 3,747,600, Cl. 128-188.000.

Andeweg, Frits J. Wax shade. 3,748,464, Cl. 240-108.00r.

Andresen, Sigurd, to Airco, Inc. Power supply. 3,748,536, Cl. 317-16.000.

Andrews, Eugene Walter; and Klein, Donald Robert, said Klein assor. to Sheller-Globe Corporation and said Andrews assor. to Ford Motor Company. Plastic wheel cover. 3,747,984, Cl. 301-37.00p.

Ankeny, Jay H.; Foddy, Harold W.; and Kessler, Dayton F., to Delavan Manufacturing Company. Balanced hydraulic device. 3,747,476, Cl. 91-489.000.

Annenberg, Ernest Alexandrovich: *See—*
Fedjukin, Dmitry Lvovich; Sergeeva, Ljudmila Semenovna; Bakharev, Andrei Nikolaevich; Korochkin, Petr Evmenovich; Aronov, Anatoly Izrailevich; Gorlina, Inna Leonidovna; Kravets, Arkady Timofeevich; Goloskov, Emmanuil Isaakovich; Annenberg, Ernest Alexandroich; Fedotova, Svetlana Evgenievna; and Bezverkhny, Grigory, 3,747,281.

Annetts, Bryan Charles: *See—*
Cox, Alan John; and Annetts, Bryan Charles, 3,747,279.

Anthony, Eugene Michael, to Dart Industries, Inc. Linerless closure. 3,747,792, Cl. 215-40.000.

Aoki, Kenneth K.; and Mc Master, Arnold L., to BASF Wyandotte Corporation. Process for the preparation of hexachloro cyclopentadiene. 3,748,281, Cl. 252-441.000.

Aoki, Naonori: *See—*
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Appalachian Electronic Instruments, Inc.: *See—*
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Applied Power Inc.: *See—*
Knutson, Dale A., 3,747,472.

Aquarius, Conrardus Hubertus. Apparatus for severing pieces from a string of sugar. 3,747,453, Cl. 83-117.000.

Arai, Hiroshi; Komuro, Yoshiaki; and Kasai, Akinari, to Sansha Electric Manufacturing Company, Limited. Storage battery charging device. 3,748,567, Cl. 320-22.000.

Arai, Michio, to Sony Corporation. Magnetoresistance element and method of making the same. 3,747,201, Cl. 29-574.000.

Araki, Kazumi: *See—*
Noguchi, Yuichi; Araki, Kazumi; and Aoki, Naonori, 3,748,232.

Arbogast, Ray D.; Neuroth, Russell D.; and Haight, John T., to Kaystone Consolidated Industries, Inc. Broken tool detector. 3,747,142, Cl. 10-7.000.

Arcesi, Joseph A.: *See—*
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Arcesi, Joseph A.; Rauner, Frederick J.; McConkey, Robert C.; and Noonan, John W., to Eastman Kodak Company. Photopolymerizable compositions and elements and uses thereof. 3,748,132, Cl. 96-35.100.

Archambalut, Joseph W.: *See—*
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Arenz, Werner: *See—*
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Argentieri, Michael A., to Intercontinental Dynamics Corporation. Altimeter baro-setting mechanism. 3,747,409, Cl. 73-387.000.

Armadillo Holdings, Ltd.: *See—*
Atkins, Stanley G.; and Baillie, Stanley B. (said Baillie assor. to), 3,747,701.

Armstrong, Robert K.; Brenna, Gerald L.; and Sullivan, Robert H., to Du Pont de Nemours, E. I., and Company. 2,3-Bis(difuluoramino)-1,4-butanediol diformate and dinitrate. 3,748,351, Cl. 260-467.000.

Arnold, Orlan M.; and Vancini, Carlo A., to Peabody Engineering Corporation. Deflector plate support. 3,747,906, Cl. 261-118.000.

Aronov, Anatoly Izrailevich: *See—*
Fedjukin, Dmitry Lvovich; Sergeeva, Ljudmila Semenovna; Bakharev, Andrei Nikolaevich; Korochkin, Petr Evmenovich; Aronov, Anatoly Izrailevich; Gorlina, Inna Leonidovna; Kravets, Arkady Timofeevich; Goloskov, Emmanuil Isaakovich; Annenberg, Ernest Alexandroich; Fedotova, Svetlana Evgenievna; and Bezverkhny, Grigory, 3,747,281.

Art Steel Company, Inc.: *See—*
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Arthur, William C., to Storage Technology Corporation. Motor control circuit for tape drive. 3,748,552, Cl. 318-7.000.

Arvin, Earl F.: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Ashany, Ron; and Lindquist, Arwin B., to International Business Machines Corporation. Toroidal interconnection system. 3,748,647, Cl. 340-172.500.

Ashe, Thomas A., to Du Pont de Nemours, E. I., and Company. Polyesters with polycarboxy terminal groups. 3,748,308, Cl. 260-78.30r.

Ashley, Eugene; and Tassie, Douglas P., to General Electric Company. Linear linkless ammunition feed system. 3,747,469, Cl. 89-34.000.

Asta, Geno Dall: *See—*
Greco, Alberto; Carbonaro, Antonio; and Asta, Geno Dall, 3,748,279.

Astapovich, Artem Ivanovich; Bogoljubov, Sergei Alexandrovich; Kuznetsov, Nikolai Ivanovich; Lupanov, Oleg Dmitrievich; Pustovarin, Ivan Yakovlevich; and Fedorova, Tamara Alexeevna. Bed for shaping sheet steel panels having spatial curvature. 3,747,183, Cl 29-200.00p.

Astay, Leone Dall: *See—*
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Astrotronics Research Ltd.: *See—*
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AT & M Corporation: *See—*
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Atkins, Stanley G.; and Baillie, Stanley B., said Baillie assor. to Armadillo Holdings, Ltd. Rotational device for earth boring tools. 3,747,701, Cl. 175-323.000.

Atkinson, Jerry T., to Alloy Products Corporation. Acid carboy. 3,747,799, Cl. 220-69.000.

Atlas Copco Aktiebolag: *See—*
Persson, Jan Edvard, 3,748,069.

Atlas Metal Industries, Inc.: *See—*
Salkoff, Goodwin; and Nusbaum, Elmer R., 3,747,540.

Atterbury, Robert Edwin, to Foseco International Limited. Treatment of molten ferrous metals. 3,748,121, Cl. 75-58.000.

Aubuchon, Kenneth G.; Dill, Hans G.; and Bower, Robert W., to Hughes Aircraft Company. Self-registered doped layer for preventing field inversion in miscircuits. 3,748,187, Cl. 148-1.500.

Auer, John H., Jr.: *See—*
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., 3,748,466.

Aumiaux, Michel, to Societe d'Etudes Recherches et Construction Electroniques S.E.R.C.E.L. Continuous amplifier assembly with drift connection. 3,748,587, Cl. 330-9.000.

Autoclave Engineers, Inc.: *See—*
Marchal, Francis V., 3,747,798.

Automobiles Peugeout: *See—*
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Avco Corporation: *See—*
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Avicon, Inc., mesne: *See—*
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Avtges, James A.; Reid, Jerome L.; Schlein, Herbert N.; and Taylor, Lloyd D., to Polaroid Corporation. Dye image providing materials within diffusion transfer barrier layers. 3,748,129, Cl. 96-3.000.

Babcock, David L.; and Sypula, Richard J., to Eastman Kodak Company. Opticalito-electrical signal transducer apparatus. 3,748,485, Cl. 250-226.000.

Bach, Lloyd G.; and Ewald, Jerome T., to Bendix Corporation, The. Closed center booster with two-stage hydraulic reaction. 3,747,473, Cl. 91-373.000.

Bache, Helmut: *See—*
Ruggen, Werner; Krellmann, Herbert; and Bache, Helmut, 3,747,366.

Baer, Jacob F. Fishing apparatus. 3,747,248, Cl. 43-43.130.

Baert, Roger Bertrand: *See—*
Holster, Peter Leendert; Smulders, Hendricus Franciscus Gerardus; and Baert, Roger Bertrand, 3,747,645.

Bahnsen, Gerhard I. W. Film packet and holder. 3,747,496, Cl. 95-72.000.

Bailey, Hubert Charles, to BP Chemicals Limited. Process for the stabilization of acrylonitrile by distillation with a nitroxide. 3,747,988, Cl. 203-8.000.

Bailey, James Rushton, to Rush-Hampton, Inc. Room air deodorizer. 3,747,902, Cl. 261-30.000.

Bailiff, Vernon Brooks. Universal ring jaws. 3,747,945, Cl. 279-15.00j.

Baillie, Stanley B.: *See—*
Atkins, Stanley G.; and Baillie, Stanley B., 3,747,701.

Baker, Norman: *See—*
Erlichman, Stanton Roy; Woolf, Harold; and Baker, Norman, 3,747,190.

Baker, Richard H., to Massachusetts Institute of Technology. Light-triggered electric power source. 3,748,492, Cl. 307-117.000.

Baker, Richard L., to Colt Industries Operating Corporation. Safety mechanism having cocked indicator. 3,747,251, Cl. 42-70.00d.

Bakharev, Andrei Nikolaevich: *See—*
Fedjukin, Dmitry Lvovich; Sergeeva, Ljudmila Semenovna; Bakharev, Andrei Nikolaevich; Korochkin, Petr Evmenovich; Aronov, Anatoly Izrailevich; Gorlina, Inna Leonidovna; Kravets, Arkady Timofeevich; Goloskov, Emmanuil Isaakovich; Annenberg, Ernest Alexandroich; Fedotova, Svetlana Evgenievna; and Bezverkhny, Grigory, 3,747,281.

Bakker Development Corporation: *See—*
Bakker, Lubertus, 3,748,123.

Bakker, Lubertus, to Bakker Development Corporation. Process for metal recovery. 3,748,123, Cl. 75-97.000.

Bakly, Peter K.; and McCulloch, Alistair, to Graviner (Colnbrook) Limited. Pressure-responsive apparatus. 3,747,557, Cl. 116-70.000.

Balbach, Guenter; and Reinert, Guenther, to Bohme, Dr. Th., Kg. Chem. Fabrik. Use of sulfonamide derivatives having oxygen-containing end groups as modifying agents and/or pigment grinding agents for the manufacture of molded polyurethane articles and polyrethane varnishes. 3,748,296, Cl. 260-308.00r.

Baldwin, D. H., Company: *See—*
Munch, Walter, Jr.; Wagner, William S.; and Uetrecht, Dale M., 3,748,598.

Baldwin, Richard N., to A. & A. Engineering Co. Depth stop sensing device for an electrical discharge machine. 3,748,427, Cl. 219-69.00s.

Balitzky, Gloria J.; and Sellers, Harold. Floating light for swimming pools. 3,748,457, Cl. 240-6.40f.

Ballinger, Forrest H.: *See—*
Stevens, Harry S.; Karr, Jerry W.; Miller, Dennis D.; and Ballinger, Forrest H., 3,748,580.

Ballis, William L.: *See—*
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Ballou, Raymond J.: *See—*
Fico, Louis; Sheker, Roger N.; Ballou, Raymond J.; and Cosman, David C., 3,748,450.

Ballou, Richard P., to General Motors Corporation. Light control circuit. 3,748,529, Cl. 315-83.000.

Balzano, Alfiero F.: *See—*
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Banford, John Alexander: *See—*
Pearson, Whitney Lombard; Banford, John Alexander; and Szymanski, Earl Thaddeus, 3,748,209.

Bangert, Hans; and Arenz, Werner, to Orenstein & Koppel Aktiengesellschaft. Self-propelling vehicle with tree-felling shears. 3,747,651, Cl. 144-34.00a.

Barabas, Andrew A., to Castro Convertible Corporation. Convertible sofa bed. 3,747,135, Cl. 5-13.000.

Baraglis, Nathan: *See—*
Wright, George C.; Kozel, Charles; Baraglis, Nathan; and Marciszewski, Ed, 3,748,521.

Barber, Richard H., to McGill Manufacturing Company, Inc. Multiple element bearing seal. 3,748,003, Cl. 308-187.200.

Barden Corporation, The: *See—*
McKee, Lewis W., 3,748,004.

Barecki, Chester J., to American Seating Company. Transit seat with contoured plastic shell. 3,747,978, Cl. 297-445.000.

Barecki, Chester J., to American Seating Company. Cantilevered seat for motorcoach vehicles or the like. 3,747,979, Cl. 297-451.000.

Bargen,David W.: *See—*
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.

Barker, James E.; and MacDonald, Howard R., to Rohr Industries, Inc. Interlocking, ring type ball bearing with seals. 3,748,002, Cl. 308-174.000.

Barland, Lauri C., to Precision Industries, Inc., mesne. Stitching machines. 3,747,823, Cl. 227-99.000.

Barland, Lauri C., to Precision Industries, Inc., mesne. Stitching head apparatus. 3,747,825, Cl. 227-90.000.

Barlow, Gordon A., to Glass, Marvin, & Associates. Maze game apparatus. 3,747,930, Cl. 273-113.000.

Barnes, Robert E.; and Secor, Nelson A., to Bead Chain and Manufacturing Company, The. Hollow contact pin with wire wrap terminal and method of making same. 3,748,634, Cl. 339-258.00r.

Barnette, Bert W.: *See—*
Merkel, Charles M.; and Barnette, Bert W., 3,747,985.

Baron, Frank A., to Mallinckrodt Chemical Works. Method of purification of N-acetyl-p-aminophenol. 3,748,358, Cl. 260-562.00p.

Barrell, John M.; and Moreland, Michael L. Building structure. 3,747,290, Cl. 52-90.000.

Barrera, Salvatore E., to Wilkes Pool Corporation. Filter unit and filtrate collector therefor. 3,747,768, Cl. 210-288.000.

Barrett, Burton M.; and Franks, Buyrl A., to Lowrance Electronics Mfg. Corporation. Light shield for an indicating instrument. 3,747,413, Cl. 73-431.000.

Barrett, Gilbert R. Game apparatus. 3,747,934, Cl. 273-135.00e.

Barrett, Harrison H., to Raytheon Company. Imaging system utilizing sparial. 3,748,470, Cl. 250-71.50s.

Barrigher, Charles J.; Devlin, Charles L.; and Malone, Paul E., to General Electric Company. Variable rate load setback circuit. 3,748,491, Cl. 307-149.000.

Bartholoma, Karl: *See—*
Stroezel, Reinhold; Vogel, Eberhard; Hettich, Alfred; Bartholoma, Karl; Hahner, Reinhard; and Lederer, Hans, 3,747,280.

Bartholomew, Roy E., to Bendix Corporation, The. Air/hydraulic parking-emergency brake system. 3,747,993, Cl. 303-68.000.

Barton, James, to Ionic International Inc. Barrel type processing apparatus. 3,748,249, Cl. 204-214.000.

Barwicki, Werner: *See—*
Fomm, Klaus Heinrich; and Barwicki, Werner, 3,747,145.

Barzettes, Les: *See—*
Gyongyos, Ivan; and Barzettes, Les, 3,747,666.

BASF Wyandotte Corporation: *See—*
Aoki, Kenneth K.; and Mc Master, Arnold L., 3,748,281.
Cenker, Moses; Kan, Peter T.; Patton, John T., Jr.; and Robertson, Earl J., 3,748,289.
Schmidt, John E.; and Metcalfe, Robert P., 3,748,250.
Schmolka, Irving R., 3,748,276.

Basi, Jagtar S.; and Sandhu, Jagtar S., to International Business Machines Corporation. Simultaneous double diffusion into a semiconductor substrate. 3,748,198, Cl. 148-188.000.

Bassi, Ezio; and Riitano, Francesco, said Bassi assor. to Cooperative Industriale Romagnola. Andodontic instrument for concurrent programmed boring, spraying and cleansing of dental root channels. 3,747,216, Cl. 32-57.000.

Battelle Memorial Institute: *See—*
Zuppiger, Paul, 3,747,534.

Battista, Orlando A., to Avicon, Inc., mesne. Photographic coatings containing a water-insoluble, ionizable partial salt of collagen. 3,748,142, Cl. 96-114.000.

Bauer, Gerald H. Wire shaping tool. 3,747,648, Cl. 140-147.000.

Baufa-Werke Richard Rinker: *See—*
Jany, Johann, 3,747,526.

Bauger, Louis Jules: *See—*
Bouiller, Jean Georges; Lacroix, Armand Jean-Baptiste; and Bauger, Louis Jules, 3,748,058.

Bauger, Madeleine Henriette Aimee: *See—*
Bouiller, Jean Georges; Lacroix, Armand Jean-Baptiste; and Bauger, Louis Jules, 3,748,058.

Bauman, George F., to Rieke Corporation. Plastic closure-receiver for metal container. 3,747,962, Cl. 285-202.000.

Bauman, Patrick S., to Essex International Inc. Convertible fluid pressure regulator. 3,747,629, Cl. 137-270.000.

Baumer, Wilhelm: *See—*
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,748,096.

Bavaro, Nicholas M.: *See—*
Newman, James W.; Zajac, Ronald E.; and Bavaro, Nicholas M., 3,747,746.

Bawa, Jaspal S., to Thomas & Betts Corporation. Coupling. 3,747,960, Cl. 285-39.000.

Baxter, John Vivian, to International Standard Electric Corporation. Data transmission over pulse code modulation channels. 3,748,393, Cl. 179-15.0af.

Bayer Aktiengesellschaft: *See—*
Liebsch, Dietrich; Meisert, Ernst; and Stopp, Gerhard, 3,748,329.
Oertel, Harald; Eholzer, Ulrich; and Rosendahl, Friedrich-Karl, 3,748,357.

Baynham, Alexander Christopher; and Dunsmore, Michael Robert Buchanan, to National Research Development Corporation. Tunable microwave filters. 3,748,605, Cl. 333-73.00s.

Bead Chain and Manufacturing Company, The: *See—*
Barnes, Robert E.; and Secor, Nelson A., 3,748,634.

Beale, Julian Robert Anthony, to U.S. Philips Corporation. Semiconductor device with internal channel stopper. 3,748,545, Cl. 317-235.00r.

Bean, Samuel L.; and Montone, Anthony W., to Allied Chemical Corporation. Process for the production of hydrous granular sodium silicate. 3,748,103, Cl. 23-313.000.

Beardmore, Geoffrey, to Smiths Industries Limited. Gyroscopes including gas lubricated bearings. 3,747,417, Cl. 74-5.00r.

Bearings, Seals & Gears, Inc.: *See*—
Carlson, Jerome A., 3,747,640.

Beaumont, William, Hospital: *See*—
Cook, Kenneth J., 3,747,605.

Beavers, Bobby R., to Advanced Technology Center, Inc., mesne. Method for making an acoustic transducer. 3,747,204, Cl. 29-594.000.

Beck, James E.; and Ho, Edward J., to Bell & Howell Company. Audio-visual method and apparatus. 3,748,027, Cl. 352-17.000.

Beck, Martin. Apparatus for harvesting sod. 3,747,686, Cl. 172-20.000.

Becker, Erwin; and Putscher, Johann, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus for use with flashcubes or the like. 3,747,491, Cl. 95-11.00l.

Becker, Hans-Dieter; and Gilbert, Alfred R., to General Electric Company. Halogenated biphenol polyesters and polycarbonates. 3,748,303, Cl. 260-47.0xa.

Becker, Willi, to Pfeiffer, Arthur, Vakuumtechnik GmbH. Rotor and stator wheel construction for a turbo molecular pump. 3,748,055, Cl. 415-90.000.

Becton, Dickinson and Company: *See*—
Hadtke, Frederick B., 3,747,655.

Beecroft, Roland J.: *See*—
Horvath, Joseph L., 3,747,419.

Beggs, Donald; and Scarlett, John C., to Midland-Ross Corporation. Method of and apparatus for reducing iron oxide to metallic iron. 3,748,120, Cl. 75-35.000.

Beinisovich, Boris Anatolievich: *See*—
Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich, 3,747,149.

Beiser, Leo, to Columbia Broadcasting System, Inc. Near-confocal device for optical scan enhancement. 3,748,014, Cl. 350-7.000.

Belgard, Truly M. Oven broiler cooking utensil. 3,747,506, Cl. 99-349.000.

Bell & Howell Company: *See*—
Beck, James E.; and Ho, Edward J., 3,748,027.
Henderson, James B., 3,748,030.

Bell, Leo A. Apparatus for automatically measuring pipe running into or out of a well. 3,747,218, Cl. 33-134.00a.

Bell, Ralph G., to Schlumberger Technology Corporation. Cement evaluation logging utilizing reflection coefficients. 3,747,702, Cl. 181-15.0be.

Bell Telephone Laboratories, Incorporated: *See*—
Beurrier, Henry Richard, 3,748,588.
Casterline, Russell Carson; Garraty, William Clayton; and Scanlon, John Michael, 3,748,389.
Fisher, Reed Edward; and Smith, John Nelson, 3,748,600.
Goell, James Emanuel, 3,748,246.
Henry, Charles Howard; and Kukimoto, Hiroshi, 3,748,579.
Jones, Charles Elmer, Jr., 3,748,577.
Kaufman, Stanley; Lutchansky, Milton; and Sabia, Raffaele Antonio, 3,748,606.
Mc Fowen, James Royce; Opferman, David Clement; and Smith, Robert McKee, 3,748,649.
Reinhart, Franz Karl, 3,748,597.
Seidel, Harold, 3,748,601.
Tompsett, David Elliott, 3,747,644.
Wang, Han-Chiu, 3,748,604.

Beloit Corporation: *See*—
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Bendix Corporation, The: *See*—
Bach, Lloyd G.; and Ewald, Jerome T., 3,747,473.
Bartholomew, Roy E., 3,747,993.
Burnett, Richard T., 3,747,711.
Hendrickson, Richard T., 3,747,987.
Pauwells, Edward M., 3,747,705.
Ritsema, Irving R.; and Goerke, Frederick E., 3,747,991.
Rossire, F. Henry, 3,748,016.
Runkle, Dean E., 3,747,475.
Schnipke, Dennis E., 3,747,992.
Sherman, Charles R., 3,747,395.
Stout, Gilbert T., 3,747,712.
Zipin, Richard B., 3,748,043.

Bennett, Stewart, to Polaroid Corporation. Photographic motion picture apparatus. 3,747,488, Cl. 95-112.000.

Bennewitz, Paul F., to Thunder Scientific Corporation. Moisture sensing element and method of making same. 3,748,625, Cl. 338-34.000.

Bennington, William E. Dental floss dispenser. 3,747,611, Cl. 132-91.000.

Benoit, Alfred E. Bow sight. 3,747,222, Cl. 33-265.000.

Benson, Harold L.; and Callaway, Dwight W., to General Electric Corporation. Tailless wedge bonding of gold wire to palladium-silver cermets. 3,747,198, Cl. 29-471.100.

Benson, John S. Chiropractic table. 3,747,916, Cl. 269-322.000.

Berger, Curt, to Wallengerg, Henry, & Co. Process for the manufacture of combustible cases for fuel charges or explosive charges. 3,747,532, Cl. 102-97.000.

Bergmann, Gerhard. Mounting for the vertical hook of a jacquard mechanism. 3,747,647, Cl. 139-59.000.

Berk, Jeremiah E., Esq.: *See*—
Odom, George P., 3,747,926.

Berkovits, Barouh V., to American Optical Corporation. Atrial and ventricular demand pacer with separate atrial and ventricular beat detectors. 3,747,604, Cl. 128-419.00p.

Berkovsky, Alexandr Mikhailovich; Turetsky, Veniamin Efimovich; Kulakov, Vladimir Petrovich; and Vakhrameev, Leonid Alexandrovich. Device for electric heating of the anodes in high-voltage mercury-arc rectifiers. 3,748,530, Cl. 315-114.000.

Berman, Irwin, to Foster Wheeler Corporation. Pressure vessel. 3,747,795, Cl. 220-3.000.

Berney, Joseph C. Handling apparatus for foldable cartons. 3,747,482, Cl. 93-53.00r.

Bernheim, Willy; and Deiner, Hans, to Chemische Fabrik Pfersee GmbH. Process for producing emulsions of organopolysiloxanes. 3,748,275, Cl. 252-312.000.

Bernstein, Julius, to Edo Corporation. Piezoelectric helmholtz resonator for energy conversion. 3,748,502, Cl. 310-8.000.

Berry, Thomas F.: *See*—
Tarshis, Lemuel A.; Walker, James L.; and Berry, Thomas F., 3,748,107.

Berryman, Carlene. Therapeutic walking apparatus. 3,747,233, Cl. 35-29.00r.

Bertea Corporation: *See*—
Wilkerson, William D.; and Henry, A. P., 3,747,351.

Bertozzi, Eugene R., to Thiokol Chemical Corporation. One package heat activatable polysulfide cure system. 3,748,314, Cl. 260-79.000.

Bestenreiner, Friedrich; and Deml, Reinhold, to Agfa-Gevaert Aktiengesellschaft. Photographic recording and reproducing method and apparatus utilizing spatial carrier frequencies. 3,748,019, Cl. 350-162.0sf.

Beta Engine Systems Corporation: *See*—
South, Rubert F., 3,748,533.

Betcher, Alexandr Samuilovich: *See*—
Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich, 3,747,149.

Bethleham Steel Corporation: *See*—
Graham, Hugh S.; and Hughes, Charles R., 3,747,764.

Bethlehem Steel Corporation: *See*—
Reed, George G., Jr.; Karpinski, Janusz M.; and Fox, Sidney V., 3,748,116.

Betts, Malcolm Charles: *See*—
Heyes, Roger Wallace; Betts, Malcolm Charles; and Cranswick, Helen Barbara, 3,748,411.

Betz Laboratories, Inc.: *See*—
Weisstuch, Aaron, 3,748,247.

Beurrier, Henry Richard, to Bell Telephone Laboratories, Incorporated. Impedance-matched amplifiers. 3,748,588, Cl. 330-30.00r.

Beutl, Gerhard, to Kronseder, Herrmann. Rotary label transfer apparatus. 3,748,210, Cl. 156-567.000.

Beyer, Rolf H.; Collings, Peter R.; and Laponsky, Alfred B., to Westinghouse Electric Corporation. Broad spectral response pickup tube. 3,748,523, Cl. 315-10.000.

Beyerle, Rudi; and Stachel, Adolf; deceased (by Stachel, Ingeburg Lydia Katharina; heiress-at-law), to Casella Farbwerke Mainkur Aktiengesellschaft. Basically substituted 4(3H)-quinazolinone derivatives. 3,748,327, Cl. 260-243.00b.

Bezverkhny, Grigory: *See*—
Fedjukin, Dmitry Lvovich; Sergeeva, Ljudmila Semenovna; Bakharev, Andrei Nikolaevich; Korochkin, Petr Evmenovich; Aronov, Anatoly Izrailevich; Gorlina, Inna Leonidovna; Kravets, Arkady Timofeevich; Goloskov, Emmanuil Isaakovich; Annenberg, Ernest Alexandroich; Fedotova, Svetlana Evgenievna; and Bezverkhny, Grigory, 3,747,281.

Bhankuni, Roop S.; and Cormany, Joseph L., Jr., to Goodyear Tire & Rubber Company, The. Polyurethane finish additive. 3,748,291, Cl. 260-18.0tn.

Bickoff, Emanuel M.; and Kohler, George O., to United States of America, Agriculture. Method of preparing animal litter. 3,747,564, Cl. 119-1.000.

Bienvenu, Jacques Michel Jean: *See*—
DeBruyne, Guy Jules Achille Pierre; and Bienvenu, Jacques Michel Jean, 3,748,653.

Biese, Joseph J.: *See*—
Jones, William E.; Halpin, Donald A.; and Biese, Joseph J., 3,747,673.

Billings, William G.; and Nelson, William T. Nickel-calcium aluminate-barium salt catalyst. 3,748,280, Cl. 252-430.000.

Billings, William W.; and Calfee, Wendell, to Westinghouse Electric Corporation. Over and under excitation protection circuit for alternating current power systems including improved demodulator circuit. 3,748,493, Cl. 307-232.000.

Bilow, Norman; and Rosenberg, Harold. Cured polyferrocenylenes and process for curing. 3,748,206, Cl. 156-327.000.

Bilton, John, to Fluidrive Engineering Company, Limited. Hydrodynamic power drives. 3,747,348, Cl. 60-351.000.
Binkley, Jonathan A. Wind weight. 3,747,887, Cl. 248-361.00r.
Bird Machine Company, Inc.: *See*—
Nichols, George E., Jr., 3,748,428.
Bird, Robert J., to American Optical Corporation. Laser beam attitude control device. 3,748,041, Cl. 356-149.000.
Bishop, Walter F., to Dormeyer, A. F., Manufacturing Co. Portable electric appliance. 3,747,594, Cl. 128-49.000.
Bissonette, Vernon L., to Eastman Kodak Company. Metal complex in silver halide development. 3,748,138, Cl. 96-66.300.
Bitney, Robert H. Pallet box. 3,747,794, Cl. 217-15.000.
Bland, Edward Floyd: *See*—
Bland, Edward N., 3,747,574.
Bland, Edward N., to Bland, Edward Floyd. Internal combustion engine. 3,747,574, Cl. 123-21.000.
Blasse, George; and De Vries, Jaap, to U.S. Philips Corporation. Low-pressure mercury vapour discharge lamp. 3,748,516, Cl. 313-109.000.
Blinne, David L.: *See*—
Peterson, Wayne L.; Blinne, David L.; and Sanderson, Robert W., III, 3,747,723.
Blize, Roy L.: *See*—
Speirs, Kenneth K.; Weinstein, Martin; and Blize, Roy L., 3,748,172.
Blizzard, Roy L.: *See*—
Davis, Robert D.; Meyer, Theodore N.; and Blizzard, Roy L., 3,748,106.
Block, Aleck, to Merit Abrasive Products, Inc., mesne. Rotary abrasive device. 3,747,285, Cl. 51-358.000.
Bloemke, Richard E.: *See*—
Wiltsey, Donald G.; Oberhofer, Alfred W.; Bloemke, Richard E.; and Karklins, Arnold, 3,748,285.
Bobbin Monitor Corporation: *See*—
Mayer, Nathan; and Lanes, Stanley S., 3,747,547.
Bock, Richard W., to Demarest, John. Speaker support system. 3,747,880, Cl. 248-361.00r.
Bodine, Albert G. Sonic hand cultivator. 3,747,687, Cl. 172-40.000.
Boeing Company, The: *See*—
Bosworth, Thomas J.; and Jackson, Lowell L., 3,748,432.
Boekhorst, Antonius; and Rietveld, Jan Joost, to U.S. Philips, Corporation. Circuit arrangement for generating in a picture display device a sawtooth current of line frequency having an amplitude varying at field frequency. 3,748,531, Cl. 315-27.060.
Boes, Roger T. Automatic shut-off valve system. 3,747,618, Cl. 137-80.000.
Boesch, William J., to Special Metals Corporation. Nickel base alloy. 3,748,192, Cl. 148-32.500.
Bogoljubov, Sergei Alexandrovich: *See*—
Astapovich, Artem Ivanovich; Bogoljubov, Sergei Alexandrovich; Kuznetsov, Nikolai Ivanovich; Lupanov, Oleg Dmitrievich; Pustovarin, Ivan Yakovlevich; and Fedorova, Tamara Alexeevna, 3,747,183.
Bohlman, Ivan C. Tool to clean out vegetation from around sprinkler heads. 3,747,214, Cl. 30-300.000.
Bohme, Dr. Th., Kg. Chem. Fabrik: *See*—
Balbach, Guenter; and Reinert, Guenther, 3,748,296.
Boke, Reinhard; Schmid, Alfred; and Wilke, Heinz, to Bosch, Robert, G.m.b.H. Apparatus for making coils for armatures of electrical machines or the like. 3,747,188, Cl. 29-205.00c.
Bondarev, Anatoly Ivanovich: *See*—
Melbard, Sergei Nikolaevich; Shakhnov, Anatoly Fedorovich; Gelman, Alexandr Shmulevich; Slepak, Moscowiezra Shmulevich; Oblasti, Malakhovka Moskovskoi; Vivsik, Svyatoslav Nikolaevich; Bondarev, Anatoly Ivanovich; Desyatskov, Leonid Pavlovich; and Morozov, Iadimir Sergeevich, 3,748,431.
Bonis, Scott A.; Salzer, Thomas E.; and Robillard, David R., to Raytheon Company. Wire spool package. 3,747,870, Cl. 242-137.100.
Bookbinder, Oscar: *See*—
Wilson, Arthur K.; and Bookbinder, Oscar, 3,748,461.
Boon, Bruce T. E., to Eastern Cyclone Industries, Inc. Pneumatic bulky material collector system. 3,747,986, Cl. 302-62.000.
Booth, Christopher John, to C. & W. Walker Limited. Oil burning submerged combustion units. 3,747,588, Cl. 126-360.00a.
Borchard, Heinz: *See*—
Knothe, Herbert; Buck, Jurgen; Borchard, Heinz; and Rybka, Bruno, 3,747,390.
Borden, Douglas G.: *See*—
Reynolds, George A.; Laakso, Thomas M.; Borden, Douglas G.; and Williams, Jack L. R., 3,748,131.
Borden, Howard C., Jr., to American Micro-Systems, Inc. Universal transmission reflectance mode liquid crystal display. 3,748,018, Cl. 350-160.0lc.
Bordowsky, Karl Heinz: *See*—
Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, 3,747,727.
Borenius, Gunnar: *See*—
Goes, Friedrich; Seiffert, Ulrich; Hinzmann, Dieter; and Borenius, Gunnar, 3,747,953.
Borg, Paul E.: *See*—
Branham, Donald R.; and Borg, Paul E., 3,747,402.
Borg-Warner Corporation: *See*—
Smirl, Richard L., 3,747,731.
Borgordts, H & E: *See*—
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Bosch, Robert, G.m.b.H.: *See*—
Aldinger, Ulrich, 3,747,477.
Boke, Reinhard; Schmid, Alfred; and Wilke, Heinz, 3,747,188.
Eisele, Hermann; and Eichardt, Wolfgang, 3,747,575.
Engfer, Ortwin, 3,747,949.
Karcher, Walter, 3,748,509.
Mauch, Harald; Handtmann, Dieter; Haug, Gerhard; Reichardt, Wolfgang; Doffingen, Hans Zeller; Zehender, Ernst; and Knapp, Heinrich, 3,747,577.
Stroezel, Reinhold; Vogel, Eberhard; Hettich, Alfred; Bartholoma, Karl; Hahner, Reinhard; and Lederer, Hans, 3,747,280.
Bosch, Robert, Photokino G.m.b.H.: *See*—
Ackermann, Karl, 3,748,568.
Bosworth, Thomas J.; and Jackson, Lowell L., to Boeing Company, The. Apparatus for welding corrugated materials by plasma electron beam welding system. 3,748,432, Cl. 219-121.0eb.
Botzum, Richard A., to Northrop Corporation. Electromechanical flare launch and jettison device. 3,747,896, Cl. 254-150.000.
Bouiller, Jean Georges; Lacroix, Armand Jean-Baptiste; and Bauger, Louis Jules; deceased (by Bauger, Madeleine Henriette Aimee; and Olivier, Jeanne Denise; legal representatives), to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Bearig arrangement for turbine engine. 3,748,058, Cl. 415-123.000.
Bourgau, Yolande; Leroi, Jean-Claude; and Mounier, Francois, to Rhone-Progil. Crystallization process for the recovery of alkaline nitrilotraicetates. 3,748,355, Cl. 260-534.00e.
Bower, Robert W.: *See*—
Aubuchon, Kenneth G.; Dill, Hans G.; and Bower, Robert W., 3,748,187.
Bowles Engineering Corporation: *See*—
Freeman, Peter A., 3,747,643.
Bowman, Wayne A., to Eastman Kodak Company. Non-aqueous emulsions. 3,748,143, Cl. 96-114.000.
Boyer, Lynn F.; Fegley, Charles R.; and Johnson, Anderson F., Jr., to Western Electric Company, Incorporated. Treating articles for a controlled duration. 3,748,089, Cl. 432-52.000.
BP Chemicals Limited: *See*—
Bailey, Hubert Charles, 3,747,988.
Bradley, Milton, Company: *See*—
Burke, William B., 3,747,929.
Brady, W. H., Co.: *See*—
Tobey, Frederic Samuel, 3,747,865.
Brandstrom, Seth D. Control device for feeding apparatus for punch process and the like. 3,747,819, Cl. 226-25.000.
Brandt, Edison R.; and Costa, Peter F., to Polaroid Corporation. Flash socket assembly. 3,747,489, Cl. 95-11.00r.
Brandt, Edison R., to Polaroid Corporation. Lens accessory holder. 3,747,490, Cl. 95-11.000.
Brandwein, Edward K. Hand-manipulated puppet. 3,747,264, Cl. 46-154.000.
Branham, Donald R.; and Borg, Paul E., to Pyramid Derrick & Equipment Corporation. Arrangement for measuring the load on a hook carried by a traveling block which is supported from the crown block of a drilling mast. 3,747,402, Cl. 73-151.000.
Branham, Donald R., to Pyramid Derrick and Equipment Corporation. High floor pivoted mast drilling rig. 3,747,695, Cl. 173-151.000.
Braniski, Alexandru Iosif; Ionescu, Theodor D.; and Deica, Nicoalae D., to Institutul de Cercetari Metalurgice. Refractory aluminous cements. 3,748,158, Cl. 106-62.000.
Braunschweigische Maschinenbauanstalt: *See*—
Dietzel, Walter; Matusch, Siegfried; and Hemminghaus, Uwe, 3,747,943.
Bredbenner, Charles W.: *See*—
Winkler, Joseph; Bredbenner, Charles W.; and Adlum, Lawrence G., 3,748,288.
Brembs, Peter, to Licentia Patent-Verwaltungs G.m.b.H. Stepping motor with compensated angular error. 3,748,566, Cl. 318-685.000.
Brems, John H. Accumulating conveyor. 3,747,741, Cl. 198-219.000.
Brenna, Gerald L.: *See*—
Armstrong, Robert K.; Brenna, Gerald L.; and Sullivan, Robert H., 3,748,351.
Bridwell, Harold C.; and Sounders, Norman R., to Christensen Diamond Products Company. Method and apparatus for contouring and sharpening circular. 3,747,276, Cl. 51-3.000.
Brien, Andre. Illuminated instrument dials. 3,748,456, Cl. 240-2.100.
Briery, Charles C. Spare tire carrier for automobile trunks. 3,747,814, Cl. 224-42.120.
Brinkmann, Hermann: *See*—
Knupfer, Siegfried; and Brinkmann, Hermann, 3,748,049.
Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for compressing and packaging stacks of flattened juxtaposed bags or like sheet articles. 3,747,295, Cl. 53-124.00c.
Bristol Electronics, Inc.: *See*—
Miller, Stephen B., 3,748,589.
Brit-Jen Tool Co., Inc.: *See*—
Jensen, Iwer F., 3,748,052.
British Industries Plastics Limited: *See*—
Collins, George Thomas, 3,748,412.
British Steel Corporation: *See*—
Lapper, Maurice Noel, 3,748,575.
Stanworth, Colin Graham; Dixon, John; and Jones, David Ian, 3,747,408.

Brock, Robert J., to Kimberly-Clark Corporation. Soft continuous filament webs containing encapsulad filaments. 3,748,216, Cl. 161-148.000.

Brockhouse, Aubrey Devere. Animal operated toilet. 3,747,563, Cl. 119-1.000.

Bronius, Snarskis, to General Motors Corporation. Clamp assembly. 3,747,168, Cl. 24-221.00r.

Bronnimann, Arnold: *See—*
Kok, Albertus Jacobus Theodorus; and Bronnimann, Arnold, 3,747,632.

Brooke, Arthur Alan, to Delamere & Williams Company Limited. Article handling apparatus. 3,747,737, Cl. 198-31.0aa.

Brookes, Frederick J.: *See—*
Dobedoe, Thomas J. L.; Robins, Ronald F.; and Brookes, Frederick J., 3,748,639.

Brooks, Frederick J., to Astrotronics Research Ltd. Continuous filter system for waste using roll filter paper or other self-cleaning filter. 3,747,766, Cl. 210-259.000.

Brophy, Robert V.; and MacKenzie, Fred T., to USM Corporation. Thread holding and cutting. 3,747,548, Cl. 112-252.000.

Brorein, William J., to General Cable Corporation. Cord connector for printed wiring cards. 3,748,631, Cl. 339-176.0mp.

Brown & Root, Inc.: *See—*
Lochridge, Joe C.; and Gibson, Tony Leon, 3,747,356.

Brown & Williamson Tobacco Corporation: *See—*
Gravely, Lawrence Edmond; and Newton, Richard Paul, Jr., 3,747,608.

Brown, Carl, to Parker-Hannifin Corporation. Filter. 3,747,772, Cl. 210-493.000.

Brown, Cicero C. Rotary drive connection for casing drilling string. 3,747,675, Cl. 166-237.000.

Brown, Donald C. Lift gate assembly. 3,747,782, Cl. 214-75.00t.

Brown, James E., to General Electric Company. Button type cell casing and sealed button type battery. 3,748,182, Cl. 136-111.000.

Brown, Marvin L. Emergency support. 3,747,951, Cl. 280-150.00r.

Brown, Mervyn: *See—*
Kitching, Anthony George; and Brown, Mervyn, 3,748,213.

Brown Oil Tools, Inc.: *See—*
Garrett, Henry U., 3,747,633.

Brown, Roland Clough. Instant emergency fan belt replacement kit. 3,747,165, Cl. 24-31.00f.

Brown, Stanley A. Punch and die assemblies. 3,747,458, Cl. 83-520.

Brown, William M., to Ganz Brothers, Inc., mesne. Shrink pack with easy opening device. 3,747,749, Cl. 206-65.00c.

Brown-Boveri-Sulger Turbomachinery, Ltd.: *See—*
Strub, Rene, 3,747,335.

Bruan AG: *See—*
Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 3,748,503.

Bruder, Werner; Grieb, Hubert; and Tiefenbacher, Eberhard, to Daimler-Benz Aktiengesellschaft. Compact multiple-shaft re-expansion gas turbine engine with heat exchangers. 3,747,334, Cl. 60-39.170.

Bruels, Ewald: *See—*
Meurer, Hans; and Bruels, Ewald, 3,747,385.

Bruinsma, Anne Hendrik, to U.S. Philips Corporation. Circuit arrangement for producing an unambiguous marker in a television. 3,748,377, Cl. 178-5.40r.

Brumfield, Robert C. Compressible disposable filter press for blood. 3,747,769, Cl. 210-350.000.

Buck, Jurgen: *See—*
Knothe, Herbert; Buck, Jurgen; Borchard, Heinz; and Rybka, Bruno, 3,747,390.

Bucksch, Manfred: *See—*
Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, 3,747,727.

Buedingen, Robert, to Inmont Corporation. Washing device. 3,747,614, Cl. 134-109.000.

Buggs, Ralph N.: *See—*
Johnson, Edward L.; Buggs, Ralph N.; and Kornmann, Richard L., 3,748,240.

Bulbenko, George F.; Sorg, Ear H.; and Gallagher, John P., to Thiokol Chemical Corporation. One-part polythiol compositions containing encapsulated activators. 3,748,313, Cl. 260-79.000.

Bunger, Heinrich; and Renckhoff, Gustav, to Dynamit Nobel Aktiengesellschaft. Oxidation-and low temperature-resistant glycerides of natural fatty acids. 3,748,265, Cl. 252-1.000.

Bunker-Ramo Corporation, The: *See—*
Chow, Weichien, 3,747,209.

Bunnelle, Philip R.: *See—*
Wenneborg, William Z.; Payne, Bobby R.; and Bunnelle, Philip R., 3,747,696.

Burke, William B., to Bradley, Milton, Company. Player controlled tethered striking element and playing pieces. 3,747,929, Cl. 273-98.000.

Burlington Industries, Inc.: *See—*
May, Robert E.; and Triplett, Benny L., 3,748,217.
Pugh, Charles D., 3,748,648.

Burnett, Richard T., to Bendix Corporation, The. Disc brake with automatic adjuster mechanism. 3,747,711, Cl. 188-71.900.

Burnett, Sibley C.: *See—*
Ribe, Fred L.; Burnett, Sibley C.; and Ellis, William R., 3,748,226.

Burns, Eugene A.; and Jones, Robert J., to TRW Inc. Endo alicyclic end capped polyquinoxaline resins. 3,748,307, Cl. 260-72.500.

Burns, Eugene A.; and Jones, Robert J., to TRW Inc. Endo alicyclic end capped polyimidazopyrrolone. 3,748,310, Cl. 260-78.40r.

Burns, Eugene A.; and Jones, Robert J., to TRW Inc. Heterocyclic endo alicyclic end capped resins. 3,748,311, Cl. 260-78.40r.

Burns, Eugene A.; and Jones, Robert J., to TRW Inc. Thermosetting hydrazide polymers. 3,748,312, Cl. 260-78.40r.

Burton, John S. Bidirectional counter. 3,748,445, Cl. 235-92.00c.

Bushnell, Calvin L., to United Aircraft Corporation. Matrix-type fuel cell with circulated electrolyte. 3,748,179, Cl. 136-86.00r.

Busker, Leroy H.; and Francik, Crl J., to Beloit Corporation. Fibrous web press nip structure including nonporous belts backed by pistons supported with fluid pressure. 3,748,225, Cl. 162-272.000.

Buttel, Kurt: *See—*
Raaf, Helmut; and Buttel, Kurt, 3,747,804.

C & M Manufacturing Company, Inc.: *See—*
Smith, Raymond L., Jr., 3,747,790.

C. & W. Walker Limited: *See—*
Booth, Christopher John, 3,747,588.

Cabanes, Alain, to Regie Nationale des Usines Renault and Automobiles Peugeout. Electromagnetic safety latch systems. 3,747,379, Cl. 70-264.000.

Caffrey, Joseph R.: *See—*
Epstein, Peter F.; Caffrey, Joseph R.; and Yu, Pyung Kyung, 3,748,343.

Cajon Company: *See—*
Shivak, Robert A., 3,747,963.

Calabrese, Suzanne Hutchinson. Safety handle for knives. 3,747,211, Cl. 30-155.000.

Calder, Robert A. C., to International Harvester Company. Hay conditioner drive. 3,747,310, Cl. 56-1.000.

Calfee, Wendell: *See—*
Billings, William W.; and Calfee, Wendell, 3,748,493.

California R & D Center: *See—*
Schmidt, Gerald W.; Jones, Lawrence Temple; and Smith, Jay, III, 3,747,459.

Callaway, Dwight W.: *See—*
Benson, Harold L.; and Callaway, Dwight W., 3,747,198.

Calvert, Rodney K.; Scott, Dale K.; and Landrum, Charles Rabun, to Mead Corporation, The. Packaging mechanism. 3,747,294, Cl. 53-48.000.

Calzaretto, Carl. Riser structure assembly. 3,747,539, Cl. 108-91.000.

Cambridge Thermionic Corporation: *See—*
Mc Donald, William C., 3,748,554.

Camilleri, Thomas M. Preparing master pattern for producing casted raised figures. 3,747,440, Cl. 76-107.00r.

Campbell, James F.; and Nystrand, Ernst Daniel, to Kimberly-Clark Corporation. Mechanism for heat sealing. 3,748,207, Cl. 156-359.000.

Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence: *See—*
Johnson, Derwyn C., 3,747,401.

Canon Kabushiki Kaisha: *See—*
Sakaguchi, Keiichi; Furukawa, Hiroshi; Komine, Yoshio; and Shimazaki, Mamoru, 3,748,029.
Tajima, Akira; and Momiyama, Kikuo, 3,748,021.
Tajima, Akira, 3,748,022.
Tanikoshi, Kinji; and Takigawa, Tomoshi, 3,747,487.

Cantz, Rolf J., to Kennametal Inc. Tire stud. 3,747,659, Cl. 152-210.000.

Capintec, Inc.: *See—*
Lippman, Robert L.; and Sunderland, John C., 3,748,476.

Capps, William T., Sr.; and Hunnam, Robert J., to Ram-Pak, Inc. Trash-compacting apparatus. 3,747,519, Cl. 100-218.000.

Carbajal, Manuel. Process for making moldable bagasse compositions. 3,748,160, Cl. 106-99.000.

Carbonaro, Antonio: *See—*
Greco, Alberto; Carbonaro, Antonio; and Asta, Geno Dall, 3,748,279.

Carbone, Angelo F., 50% to Fallacaro, Emmanuels. Reciprocating cutting apparatus. 3,747,448, Cl. 83-4.000.

Carborundum Company, The: *See—*
Carpenter, James H.; and Good, Harper Willard, 3,747,277.

Carcia, Leslie C.; Mc Neill, John D.; Papanastastou, Theodore A.; Howers, Norman K.; and Tjonpiangi, William E., to International Business Machines Corporation. Input/output hardware trace monitor. 3,748,650, Cl. 340-172.500.

Carey, Donald W.: *See—*
Willson, James R.; and Carey, Donald W., 3,748,197.

Carle, Guy F. Apparatus for continuous casting of metal strip. 3,747,667, Cl. 164-282.000.

Carleton, James T.: *See—*
Tillie, W. Robertus J.; Carleton, James T.; and Putman, Richard E. J., 3,748,224.

Carlson, Alfred D.; and Kasper, Joseph G., to Tennant Company. Filter chamber for sweeping machine. 3,747,156, Cl. 15-349.000.

Carlson, Arthur B.; and Watson, Robert W., to Conco Inc. Load balancer with safety control. 3,747,886, Cl. 248-325.000.

Carlson, Jerome A., to Bearings, Seals & Gears, Inc. Control valve. 3,747,640, Cl. 137-625.210.

Carlson, Ronald H., to Hooker Chemical Corporation. Synergistic metal chelates. 3,748,114, Cl. 71-1.000.

Carlton Company: *See—*

Potter, Harold F., 3,748,425.

Carpenter, James H.; and Good, Harper Willard, to Carborundum Company, The. Abrasive blasting unit. 3,747,277, Cl. 51-9.000.

Carre, Paul: *See—*
Rodier, Christian; and Carre, Paul, 3,748,024.

Carrier Corporation: *See—*
Miller, Arthur J.; and Miller, Robert A., 3,748,059.

Carrier Corporation, mesne: *See—*
Pilarczyk, Karol, 3,748,065.

Carter, Leo F.: *See—*
Latinen, George A.; and Carter, Leo F., 3,747,899.

Cartridge Actuated Devices, Inc.: *See—*
Sawyer, Robert H., 3,748,413.

Caruso, Gerard. Trolling rig. 3,747,254, Cl. 43-25.200.

Cary Instruments: *See—*
Hawes, Roland C., 3,748,040.

Case, J. I., Company: *See—*
Wilcox, John P., 3,748,062.

Case, Oliver P.; Jones, Ronald B. L.; Spellman, Robert D.; and Archambalut, Joseph W., to Anaconda American Brass Company. Method for simultaneous reduction of hexavalent chromium and cementation of copper. 3,748,124, Cl. 75-109.000.

Casella Farbwerke Mainkur Aktiengesellschaft: *See—*
Beyerle, Rudi; and Stachel, Adolf, 3,748,327.

Cass, Richard, to TRW Inc. Yoke support for rack and pinion gear. 3,747,429, Cl. 74-498.000.

Cassidy, Floyd L.; and Ko, Daniel Y. C., to Gulf Research & Development Company. Two-stage dehydrocyclization process. 3,748,255, Cl. 208-65.000.

Cassidy, Floyd L.; and Ko, Daniel Y. C., to Gulf Research & Development Company. Dehydrocyclization of paraffins in the presence of added aromatics. 3,748,258, Cl. 208-138.000.

Cassidy, Floyd L.; and Ko, Daniel Y. C., to Gulf Research & Development Company. Selective dehydrocyclization process. 3,748,259, Cl. 208-138.000.

Casterline, Russell Carson; Garraty, William Clayton; and Scanlon, John Michael, to Bell Telephone Laboratories, Incorporated. Alarm detection system. 3,748,389, Cl. 179-5.00r.

Castro Convertible Corporation: *See—*
Barabas, Andrew A., 3,747,135.

C.A.V. Limited: *See—*
Fenne, Ivor, 3,747,857.

Cech, Robert E., to General Electric Company. Rare earth intermetallic compounds by a calcium hydride reduction-diffusion process. 3,748,193, Cl. 148-101.000.

Celanese Corporation: *See—*
Watson, George A., 3,747,162.

Celotex Corporation, The: *See—*
Wisner, Louis M., 3,747,447.

Celtite, Inc.: *See—*
Rausch, Paul Gilger, 3,747,442.

Cenker, Moses; Kan, Peter T.; Patton, John T., Jr.; and Robertson, Earl J., to BASF Wyandotte Corporation. Carboiimide foams reduced friability prepared in the presence of an acrylonitrile-grafted polyol. 3,748,289, Cl. 260-2.5bf.

Certain-Teed Saint Gobain Insulation Corporation: *See—*
Hoffmann, George A., Jr., 3,747,743.

Cervenka, Joseph J.; and Hetzel, Marvin E., to Cerzel Tool & Engineering Company. Machine for making wire terminals and applying same to a bobbin. 3,747,186, Cl. 29-203.00d.

Cerzel Tool & Engineering Company: *See—*
Cervenka, Joseph J.; and Hetzel, Marvin E., 3,747,186.

Cessna Aircraft Company, The: *See—*
Putnam, Richard C., 3,748,063.

Chamberlain, Anna B.: *See—*
Deike, Robert F., 3,747,690.

Chamberlain, William H.: *See—*
Deike, Robert F., 3,747,690.

Chambon, Michel, to Ferraz, Lucien, & Cie. Electric switches equipped with fuse means. 3,748,619, Cl. 337-9.000.

Champion International Corporation: *See—*
Hanson, Wallace E., 3,747,831.
Shillinger, Joseph F., 3,747,834.

Champoux, Edmond J. Out-of-phase pedals oscillated exercising device. 3,747,924, Cl. 2*2-79.00r.

Chapman, Harold Sherman. Primary transfer sub for dual concentric drillpipe. 3,747,698, Cl. 175-92.000.

Chapman, James R., to Mead Corporation, The. Shrink film package and stabilizing device therefor. 3,747,750, Cl. 206-65.00s.

Chapman, Richard D. Food carrying paper box. 3,747,832, Cl. 229-31.00r.

Chase-Shawmut Company, The: *See—*
Kozacka, Frederick J.; and Jacobs, Philip C., Jr., 3,748,622.

Chatterji, Jiten: *See—*
Malone, William T.; Holtmyer, Marlin D.; Tinsley, John M.; and Chatterji, Jiten, 3,748,266.

Chemagro Corporation: *See—*
Epstein, Peter F.; Caffrey, Joseph R.; and Yu, Pyung Kyung, 3,748,343.

Chemie Brita Geraete Ing. Karl Itter: *See—*
Hankammer, Heinz, 3,747,767.

Chemische Fabrik Pfersee GmbH: *See—*
Bernheim, Willy; and Deiner, Hans, 3,748,275.

Chen, Arthur C. M.; and Lommel, James M., to General Electric Company. Thin film nickel temperature sensor. 3,748,174, Cl. 117-217.000.

Chen, You Min, to Ohmart Corporation, The. Gauge for determining the percentage by weight of moisture contained in a bulk material transported on a moving conveyor. 3,748,473, Cl. 250-392.000.

Chevron Research Company: *See—*
Anderson, Carlo E., 3,747,854.
Hannah, Eric D., 3,748,353.
Rathburn, Richard P.; and Stanton, Garth M., 3,747,398.
Yungul, Sulhi H., 3,747,403.

Chiang, Ta-Kuan. Electrostatic precipitator. 3,747,299, Cl. 55-2.000.

Chicago Pneumatic Tool Company: *See—*
Amtsberg, Lester A.; and Wallace, William K., 3,747,441.

Chollet, Pierre: *See—*
Gervals, Edouard; Chollet, Pierre; and Ranger, Robert, 3,748,188.

Chovanec, William; and Heck, Peter J., to Art Steel Company, Inc. File cabinet with pivoted sliding front door. 3,748,005, Cl. 312-109.000.

Chow, Weichien, to Bunker-Ramo Corporation, The. Automated wiring system and method. 3,747,209, Cl. 29-629.000.

Christensen Diamond Products Company: *See—*
Bridwell, Harold C.; and Sounders, Norman R., 3,747,276.

Christensen, Mark S., to McDonnell Douglas Corporation. Rivet squeezer. 3,747,194, Cl. 29-243.540.

Christiaens, Bernard; and Martens, Guy, to Solvay & Cie. Process for the production of 1,1,1-trichloroethane. 3,748,243, Cl. 204-163.00r.

Christie, Sidney A., to United States of America, Navy. Pressure regulator and compensator. 3,747,627, Cl. 137-102.000.

Chromalloy American Corporation, The: *See—*
Speirs, Kenneth K.; Weinstein, Martin; and Blize, Roy L., 3,748,172.

Churchheus, Claude W.: *See—*
Gwin, Richard B.; Ballis, William L.; Churchheus, Claude W.; and Hutt, Bruce L., 3,748,433.

Ciancimino Design Limited: *See—*
Ciancimino, George Ernest Stora, 3,747,885.

Ciancimino, George Ernest Stora, to Ciancimino Design Limited. Modular joint. 3,747,885, Cl. 248-188.100.

Ciba-Geigy Corporation: *See—*
Darmory, Franklin P.; and De Benedetto, Marianne, 3,748,338.

Ciolli, Donald A., to VLN Corporation. Engine starting system. 3,747,719, Cl. 74-6.000.

Ciraolo, Samuel. Polluxion preventing exhaust device. 3,747,347, Cl. 60-309.000.

Cities Service Company: *See—*
Olechowski, Jerome Robert, 3,748,318.
Roth, Shirley H., 3,748,173.
Seipel, John J.; Roth, Shirley H.; and Green, Joseph, 3,748,154.

Citizen Watch Co., Ltd.: *See—*
Samura, Hiroyoshi; Nagashima, Mitsuyoshi; and Washimine, Osamu, 3,747,185.

Ciuffini, Anthony J.; Galen, Joseph J.; and Relyea, Lloyd A., to Xerox Corporation. Evaporation crucible. 3,748,089, Cl. 432-263.000.

Clark, Chester G.: *See—*
Neumann, John W.; Clark, Chester G.; and Minbiole, Louis J., Jr., 3,748,177.

Clark, Frank S., to Monsanto Company. Polyphenyl thioeter lubricating compositions. 3,748,269, Cl. 252-46.600.

Claus, Joseph V.; Landau, Michael B.; and Vartanian, George, to United States of America, Navy. Fuel cell system for underwater vehicle. 3,748,180, Cl. 136-86.00b.

Clayson N.V.: *See—*
De Coene, Frans J.; and Vanstellant, Marc G., 3,747,311.

Cleary, Robert T.: *See—*
Pesz, Robert G.; and Cleary, Robert T., 3,748,401.

Cleveland Machine Controls Inc., mesne: *See—*
Reiner, Robert Leopold, 3,748,553.

Clute, Angelo: *See—*
Hazzard, Robert D.; Trotter, Peter H.; Schlein, Kai Frederik; and Clute, Angelo, 3,748,011.

CMX Systems: *See—*
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.

Coach and Car Equipment Corporation: *See—*
Harder, Arthur J., Jr., 3,747,178.

Coal Industry (Patents) Limited: *See—*
Agnew, James Malcolm; French, Albert Graham; and Tate, David Arthur, 3,747,982.

Coats, George F., to Hurricane International. Decorative fireplace appliance assembly. 3,747,585, Cl. 126-92.00r.

Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 1/2 to Bruan AG and Siemens Aktiengesellschaft. Piezoelectric motor. 3,748,503, Cl. 310-8.600.

Cochran, Stanley R., to Du Pont de Nemours, E. I., and Company. False-twist texturing yarn with torque jet. 3,747,318, Cl. 57-157.0ts.

Codina, Jorge G., to Comard Controls, Inc. Encoder-decoder system. 3,748,388, Cl. 179-5.00r.

Cogar Corporation: *See—*
Mesnik, Robert F., 3,748,651.

Cohen, Melvin L., to St. Joseph's Hospital and Medical Center. Slide rule guide to intravenous therapy. 3,747,847, Cl. 235-85.000.

Cole, Fred H., to Cole Instrument Corporation. Programmer. 3,747,432, Cl. 74-568.00r.
Cole Instrument Corporation: *See—*
Cole, Fred H., 3,747,432.
Coleman, Michael G., to Motorola, Inc. Monolithic coupling device including light emitter and light sensor. 3,748,480, Cl. 250-211.000.
Colgate-Palmolive Company: *See—*
Gangwisch, William J.; Trimmer, Robert Henry; and Gross, William Franklin, Jr., 3,748,093.
Colibri Lighters Limited: *See—*
Retzler, William, 3,748,086.
Collette, John Wilfred; Ro, Rolland Shih-Yuan; and Sonnenberg, Fred Max, to Du Pont de Nemours, E. I., and Company. Functionally substituted terpolymers and tetrapolymers of α-olefins and process for manufacturing functional substituted copolymers. 3,748,316, Cl. 260-80.750.
Collings, Peter R.: *See—*
Beyer, Rolf H.; Collings, Peter R.; and Laponsky, Alfred B., 3,748,523.
Collins, Emmit L., Jr. Snowmobile hoist. 3,747,778, Cl. 214-1.00a.
Collins, Eugene P.; and Denner, Carl W. Cantilevered support system for structures. 3,747,289, Cl. 52-73.000.
Collins, George Thomas, to British Industries Plastics Limited. Control system for automatic machines. 3,748,412, Cl. 200-46.000.
Collins Radio Company: *See—*
Johnson, Robert A.; and Stump, Theodore M., 3,748,586.
Colt Industries Operating Corporation: *See—*
Baker, Richard L., 3,747,251.
Columbia Broadcasting System, Inc.: *See—*
Beiser, Leo, 3,748,014.
Columbia Gas System Service Corporation: *See—*
Gwin, Richard B.; Ballis, William L.; Churchheus, Claude W.; and Hutt, Bruce L., 3,748,433.
Colwell, William C., to Globe Tool and Engineering Company, The. Wire handling method and apparatus with multiple function cam actuator. 3,747,187, Cl. 29-203.00d.
Comard Controls, Inc.: *See—*
Codina, Jorge G., 3,748,388.
Comas, Jorge Rectoret. Pattern controls for circular knitting machines. 3,747,371, Cl. 66-50.00b.
Comitato Nazionale per l'Energio Nucleare: *See—*
Gerosa, Augusto; and Martini, Marco, 3,748,230.
Commercial Solvents Corporation: *See—*
Griffith, George L., 3,747,527.
Hunsucker, Jerry H.; and Mudd, Daniel, 3,748,309.
Commissariat a l'Energie Atomique: *See—*
Koehly, Gerard, 3,748,104.
Compagnie Francaise d'Etuded et de Construction Technip: *See—*
Perret, Jean Charles, 3,747,360.
Compagnie Generale d'Electricite: *See—*
Fally, Jacques; Lazennec, Yvon; and Lasne, Claude, 3,748,178.
Lavarini, Bernard, 3,748,505.
Compteurs Schlumberger: *See—*
Frayssinoux, Roland, 3,747,302.
Comtec Industries, Inc.: *See—*
Fico, Louis; Sheker, Roger N.; Ballou, Raymond J.; and Cosman, David C., 3,748,450.
Conco Inc.: *See—*
Carlson, Arthur B.; and Watson, Robert W., 3,747,886.
O'Neill, Charles J., 3,747,153.
Conley, Charles F. Method and apparatus for protecting livestock. 3,747,897, Cl. 256-10.000.
Conner, Jesse R.: *See—*
Reen, Orville W.; and Conner, Jesse R., 3,748,105.
Conrad, Sherman E., to Delavan Manufacturing Co. Swirl air nozzle. 3,747,851, Cl. 239-8.000.
Consolidated Airborne Systems, Inc.: *See—*
Wallman, Irwin, 3,747,407.
Consolidated Olive Growers: *See—*
Webster, John R., 3,748,152.
Consolidation Coal Company: *See—*
Gorin, Everett, 3,748,254.
Continental Can Company, Inc.: *See—*
King, Paul H.; and Skrzecz, Edward L., 3,747,392.
Continental/Moss-Gordin, Inc.: *See—*
Merkel, Charles M.; and Barnette, Bert W., 3,747,985.
Control Data Corporation: *See—*
Ingwersen, Larry D., 3,748,451.
Cook, Kenneth J., to Beaumont, William, Hospital. Defibrillator and method and apparatus for calibrating, testing, monitoring and/or controlling a defibrillator or the like. 3,747,605, Cl. 128-419.00d.
Cooke, George A.; and Houlihan, William J., to Sandoz-Wander, Inc. 1,4-Diaubstituted-methylenedioxy-2-(1H)-quinazolinones and quinazolinthiones. 3,748,331, Cl. 260-251.0qb.
Cooke, George A.; and Houlihan, William J., to Sandoz-Wander, Inc. Intermediates for preparing quinazolinones. 3,748,342, Cl. 260-332.30p.
Coombs, William Charles: *See—*
Middelbeek, Cornelis G., 3,747,217.
Cooper, Guy F., to United States of America, Navy. Controlled acceleration ejector piston. 3,747,474, Cl. 91-422.000.
Cooper, John; Stubbert, George; and Shepperd, William. Retractable and ventilated battery holder with special switching system. 3,748,185, Cl. 136-173.000.
Cooper, McDougall & Robertson, Limited: *See—*
Franklee, Ronald Harvey David, 3,747,805.
Cooperative Industriale Romagnola: *See—*
Bassi, Ezio; and Riitano, Francesco (said Bassi assor. to), 3,747,216.
Coors Procelain Company: *See—*
Perigo, Leon A.; and Jordan, John A., 3,747,291.
Corbani, John F., to Sloan Technology Corporation. Display system. 3,748,636, Cl. 340-3.00r.
Cordier, James R.: *See—*
Sherwood, Charles D.; and Cordier, James R., 3,747,443.
Cormany, Joseph L., Jr.: *See—*
Bhankuni, Roop S.; and Cormany, Joseph L., Jr., 3,748,291.
Cosman, David C.: *See—*
Fico, Louis; Sheker, Roger N.; Ballou, Raymond J.; and Cosman, David C., 3,748,450.
Cossaboom, Leon H. Electrically heated arm or leg sleeve. 3,748,436, Cl. 219-211.000.
Costa, Peter F.: *See—*
Brandt, Edison R.; and Costa, Peter F., 3,747,489.
Costello, Hal F., to Coswell Products, Inc. Vaporizer device. 3,748,438, Cl. 219-271.000.
Coswell Products, Inc.: *See—*
Costello, Hal F., 3,748,438.
Couch, Robert O.; and Spalding, Donald K., to Ric-Wil, Incorporated. Conduit system. 3,747,961, Cl. 285-133.00r.
Coulter Electronics, Inc.: *See—*
Jones, Alan Richardson, 3,747,412.
County Commercial Cars Limited: *See—*
Tapp, Ernest Thomas James, 3,747,338.
Covault, Dennis O., to Texas Instruments, Incorporated. Object identification by emission polarization. 3,748,484, Cl. 250-225.000.
Coverston, George C. Carburetor apparatus. 3,747,901, Cl. 261-1.000.
Cowans, Kenneth W. Flow conditioner. 3,747,598, Cl. 128-142.000.
Cowlin, Christopher J.: *See—*
Wolf, Robert L.; and Cowlin, Christopher J., 3,747,339.
Cox, Alan John; and Annetts, Bryan Charles, to Delapena Honing Equipment Limited. Honing machine. 3,747,279, Cl. 51-71.000.
Cox, Arthur, & Sons, Inc.: *See—*
Craig, Burnie M.; and Anderson, Irvin O., Jr., 3,747,158.
Crabb, William A., to Ametek, Inc. Stator lead anchoring and splice-insulating slot insulator structure and method. 3,748,51[illegible], Cl. 310-71.000.
Crabb, William A.; and Flynn, James L., to Ametek, Inc. Stator lead anchoring slot insulator. 3,748,512, Cl. 310-71.000.
Craig, Burnie M.; and Anderson, Irvin O., Jr., to Cox, Arthur, & Sons, Inc. Door hanger. 3,747,158, Cl. 16-105.000.
Cranswick, Helen Barbara: *See—*
Heyes, Roger Wallace; Betts, Malcolm Charles; and Cranswick, Helen Barbara, 3,748,411.
Creutz, Hans Gerhard, to Oxy Metal Finishing Corporation, mesne. Zinc plating. 3,748,237, Cl. 204-55.00r.
Crockford, Geoffrey William, to National Research Development Corporation. Buoyancy garment. 3,747,141, Cl. 9-341.000.
Cronson, Harry, to Ikor Incorporated. Microwave generator. 3,748,528, Cl. 315-39.000.
Crouse, John C., to General Electric Company. Multistrand windings with increased series capacitance. 3,748,617, Cl. 336-70.000.
Crow, Geoffrey George: *See—*
Roberts, Maurice; Harris, John Derek; Humpage, Roy William; and Crow, Geoffrey George, 3,747,560.
Crowe, Charles Vivian. Crankshafts or the like. 3,747,433, Cl. 74-598.000.
Crown City Plating Company: *See—*
Kadison, Leon A.; and Maguire, Eileen, 3,748,166.
Crum, James N., to Harris-Intertype Corporation. Ink fountain key control system. 3,747,524, Cl. 101-365.000.
CTS Corporation: *See—*
Zdanys, John, Jr., 3,748,627.
Culter, Robert Gordon; Hayes, Raymond; and Sang, Emmanuel, to Tektronix, Inc. Silicon diode array scan converter storage tube and method of operation. 3,748,585, Cl. 328-124.000.
Cunningham, James E.: *See—*
Epstein, Paul; Wernikoff, Robert E.; Cunningham, James E.; and Rosen, George, 3,748,379.
Cunningham, Joseph A., to Evans, Pipeline Equipment Co. Pipe mandrel for use during bending. 3,747,394, Cl. 72-466.000.
Curran, William J.; and Kulik, John J., to United States of America, Navy. Multi-color periscope view simulator. 3,748,374, Cl. 178-6.800.
Curtis Dyna-Products Corporation: *See—*
Nine, Philip L., 3,748,494.
C.W.S. Industries, Inc.: *See—*
Larson, Robert J.; and Stevens, Charles W., Jr., 3,748,637.
Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, to ZF Getriebe Gesellschaft mit beschrankter Haftung. Multiple coupling for planetary-gear trains. 3,747,727, Cl. 192-18.00a.
Dahlin, Ake Bertil Ingemar, to Norba Aktiebolag. Apparatus for swinging up emptying waste-bins or the like, which have different size and possibly also different shape. 3,747,785, Cl. 214-302.000.
Dai-Ichi Koghy Seiyaku Co., Ltd.: *See—*
Mizutani, Norio; Sasaki, Ichiro; Ito, Takamitsu; Ueno, Hiroshi; Nishizaki, Shoichi; and Ishizuka, Tetsuo, 3,748,324.
Daicel Ltd.: *See—*
Tanaka, Atsushi; Sawada, Hideo; Toba, Hirotaka; Kuumoto, Mashahiko; and Sato, Kozi, 3,748,286.

Daigle, Jack R.; Matthews, Mark G.; and Zollinger, Howard A., to Rapistan, Incorporated. Induction apparatus. 3,747,781, Cl. 198-76.000.

Daimler-Benz Aktiengesellschaft: *See—*
Altmann, Werner, 3,747,579.
Bruder, Werner; Grieb, Hubert; and Tiefenbacher, Eberhard, 3,747,334.

Daishin Trading Co., Ltd.: *See—*
Ono, Tasuku, 3,747,266.

Daitoku, Koichi; and Sugimori, Shiro, to Nippon Kogaku K.K. Camera drive system including motor drive unit and long-film magazine. 3,747,497, Cl. 95-31.0el.

Daktronics, Inc.: *See—*
Schultz, Steven H.; and Unruh, Rudy R., 3,748,646.

Dalia, Piero, to S.A.S. Officine Meccaniche Innocente Reganti di Innocente e Franco Riganti. Spacer-damper for conductors of overhead electric lines. 3,748,370, Cl. 174-42.000.

Daloz, Jacques Maurice, to Etablissements Dalor. Belt-type clutch coupling. 3,747,724, Cl. 180-75.000.

Dam Fine Products Corporation: *See—*
Hinkle, Joseph D., 3,747,509.

Damiler-Benz Aktiengesellschaft: *See—*
Uhlenhaut, Rudolf E.; Van Winsen, Friedrich H.; and Limmer, Hans, 3,747,431.

Damon Corporation: *See—*
Joyce, John E., 3,747,843.

Danek, George J., Jr.: *See—*
Wacker, George A.; and Danek, George J., Jr., 3,747,619.

Darlington, Henry S.: *See—*
Miller, James H.; and Darlington, Henry S., 3,747,751.

Darmory, Franklin P.; and De Benedetto, Marianne, to Ciba-Geigy Corporation. Soluble polyimides from aromatic dianhydrides and 10,10-di-(p-aminophenyl)thioxanthene. 3,748,338, Cl. 260-30.20r.

Dart Industries, Inc.: *See—*
Anthony, Eugene Michael, 3,747,792.
Evans, Robert D., 3,748,282.

Dauer, John J., Jr.: *See—*
Grunert, Kurt A.; and Dauer, John J., Jr., 3,748,608.

Davidson, Richard L., 25% to Parrott, Bell, Seltzer, Park & Gibson and 25% to Nixon, Robert L. Stonesetter's hand tool. 3,747,692, Cl. 173-122.000.

Davidson, William E., to General Electric Company. Self-cleaning steam iron. 3,747,241, Cl. 38-778.830.

Davis, David George Michael, to Dowty Rotol Limited. Fans. 3,747,341, Cl. 60-226.00a.

Davis, Donald E. Dental instrument. 3,747,612, Cl. 132-92.00r.

Davis, George B., Jr. Christmas tree lighting control. 3,748,488, Cl. 307-18.000.

Davis, Gordon H.; Niertit, Frank; and Root, Bernard H., to Stromberg-Carlson Corporation. Telephone line circuit embodying a triggerable avalanche device. 3,748,404, Cl. 179-99.000.

Davis, John A., Jr.; and Rhudy, John S., to Marathon Oil Company. Hydraulic fracturing process using polyethylene oxide based fracturing fluid. 3,747,681, Cl. 166-307.000.

Davis, Louis Dean: *See—*
Neumann, Otto Walter; and Davis, Louis Dean, 3,748,001.

Davis, Paul K., to Pacific Roller Die Co., Inc. Pipe tracking apparatus and method. 3,747,446, Cl. 82-53.00r.

Davis, Robert D.; Meyer, Theodore N.; and Blizzard, Roy L., to Plasmachem, Inc. Tantalum powder. 3,748,106, Cl. 29-192.000.

Dayco Corporation: *See—*
Huber, Walter E., 3,747,996.

De Benedetto, Marianne: *See—*
Darmory, Franklin P.; and De Benedetto, Marianne, 3,748,338.

De Carbon, Christian Bourcier. Shock absorber pistons. 3,747,714, Cl. 188-317.000.

De Cock, Etienne Marie, to Agfa-Gevaert N.V. Device for the detection of irregularities in a material. 3,748,482, Cl. 250-219.0df.

De Coene, Frans J.; and Vanstellant, Marc G., to Clayson N.V. Mechanism for the automatic adjustment of the header of harvesting machines. 3,747,311, Cl. 56-208.000.

De Cottis, Constant J.: *See—*
Hoffman, Jay; Weber, Raymond E.; and De Cottis, Constant J., 3,747,418.

De Fillipo, Joseph J. Golf club holder attachment for prosthesis. 3,747,128, Cl. 3-12.800.

de Lavalette, Pierre de Lacroix, to Societe Anonyme dite and SKF Compagnie d'Applications Mecaniques. Method of electrolytically marking a metallic article. 3,748,239, Cl. 204-129.400.

De Nicolay, Giuliano: *See—*
Delfrate, Egidio Alvazzi; and De Nicolay, Giuliano, 3,748,602.

De Pasquale, Ralph J., to Shell Oil Company. Preparation of alkylene carbonates by reaction of alkylene oxides with carbon dioxide. 3,748,345, Cl. 260-340.200.

De Simone, Robert S.: *See—*
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De Smit, Phillip A., to Unifab Corporation. Animal cage with portable container. 3,747,567, Cl. 119-17.000.

De Vries, Jaap: *See—*
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De Wiant Corporation, mesne: *See—*
Pepino, George T.; and Priceman, Seymour, 3,747,207.

Dean, George A., to Dean Research Corporation. Material handling system. 3,747,784, Cl. 214-152.000.

Dean Research Corporation: *See—*
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Deane, Robert C.: *See—*
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DeBolt, Arthur L.; and Liebermann, Walter A., to Northrop Carolina, Inc. Pattern jack actuator means for circular knitting machines. 3,747,370, Cl. 66-42.000.

DeBruyne, Guy Jules Achille Pierre; and Bienvenu, Jacques Michel Jean, to Societe Industrielle Honeywell Bull (Societe Anonyme). Microprogram memory for electronic computers. 3,748,653, Cl. 340-173.0bb.

Deep sea fishing: *See—*
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Deering Milliken Research Corporation: *See—*
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Deffenbaugh, James F., to Wean Industries, Inc. Flash welding. 3,748,430, Cl. 219-97.000.

Deica, Nicoalae D.: *See—*
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Deike, Robert F., 1/4 to Chamberlain, William H. and 1/4 to Chamberlain, Anna B. Jack hammer. 3,747,690, Cl. 173-118.000.

Deiner, Hans: *See—*
Bernheim, Willy; and Deiner, Hans, 3,748,275.

Delamere & Williams Company Limited: *See—*
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Delapena Honing Equipment Limited: *See—*
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Delavan Manufacturing Co.: *See—*
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Delavan Manufacturing Company: *See—*
Ankeny, Jay H.; Foddy, Harold W.; and Kessler, Dayton F., 3,747,476.

Delfrate, Egidio Alvazzi; and De Nicolay, Giuliano, to Societa Italiana Telecomunicazioni Siemens S.p.A. Determination of equalizer setting in telecommunication system. 3,748,602, Cl. 333-28.00r.

Delmag-Maschinefabrik Reinhold Dornfeld: *See—*
Kummel, Fritz; and Hennecke, Rudolf, 3,747,693.

Demarest, John: *See—*
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Dembovsky, Vladimir, to Vyxoka skola banska. Furnace for the smelting of metals and preparation of materials with high melting points. 3,747,669, Cl. 164-348.000.

Deml, Reinhold: *See—*
Bestenreiner, Friedrich; and Deml, Reinhold, 3,748,019.

Demmel, Edward J.; and Owen, Hartley, to Mobil Oil Corporation. Dual riser fluid catalytic cracking with ZSM-5 zeolite. 3,748,251, Cl. 208-74.000.

Denner, Carl W.: *See—*
Collins, Eugene P.; and Denner, Carl W., 3,747,289.

Densow, Ulrich O.; and Simmons, Lloyd A., to Outboard Marine Corporation. Crankshaft magneto system. 3,747,649, Cl. 143-32.00r.

Denzin, Warren. Pick up devices for agricultural implements. 3,747,313, Cl. 56-364.000.

Desaw, Frederick A.: *See—*
McMaster, Robert C.; Libby, Charles C.; Minchenko, Hildegard M.; and Desaw, Frederick A., 3,747,382.

Destito, Frank P.: *See—*
Durakis, Manuel A.; Silver, David A.; and Destito, Frank P., 3,748,369.

Desyatskov, Leonid Pavlovich: *See—*
Melbard, Sergei Nikolaevich; Shakhnov, Anatoly Fedorovich; Gelman, Alexandr Shmulevich; Slepak, Moscowiezra Shmulevich; Oblasti, Malakhovka Moskovskoi; Vivsik, Svyatoslav Nikolaevich; Bondarev, Anatoly Ivanovich; Desyatskov, Leonid Pavlovich; and Morozov, ladimir Sergeevich, 3,748,431.

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Eggenberger, Markus A.; and Devlin, Charles L., 3,748,540.

Diamantides, Nicholas D., to Goodyear Aerospace Corporation. Direct-gradient optical image correlation apparatus. 3,748,042, Cl. 356-163.000.

Dibelius, Norman R.; and Johnson, Robert H., to General Electric Company. Steam injection system for a gas turbine. 3,747,336, Cl. 60-39.550.

Diehl, Paul: *See—*
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Diener, James H., to General Motors Corporation. Energy absorbing bumper mount. 3,747,969, Cl. 293-89.000.

Diery, Helmut: *See—*
Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, 3,748,278.

Dietze, Wolfgang, to Siemens Aktiengesellschaft. Apparatus for production of a closed tube of semiconductor material. 3,747,559, Cl. 118-48.000.

Dietzel, Georg, Firma: *See—*
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Dietzel, Walter; Matusch, Siegfried; and Hemminghaus, Uwe, to Braunschweigische Maschinenbauanstalt. Device for packing a shaft passing through a wall. 3,747,943, Cl. 277-30.000.

Dighe, Vijaya Shanker: *See—*
Somasekhara, Shankar; and Dighe, Vijaya Shanker, 3,748,325.

Dill, Hans G.: *See—*
Aubuchon, Kenneth G.; Dill, Hans G.; and Bower, Robert W., 3,748,187.

Dilli, Sergio: *See—*
Garnett, John Lyndon; and Dilli, Sergio, 3,748,241.

Dilts, Robert L. Blood specimen oscillator. 3,747,900, Cl. 259-57.000.

Dimmock, John O.; Melngailis, Ivars; and Strauss, Alan J., to Massachusetts Institute of Technology. Method and means of construction of a semiconductor material for use as a laser. 3,748,593, Cl. 331-94.50h.

D'Imperio, Angelo G.: *See—*
Harvey, Robert J.; and D'Imperio, Angelo G., 3,747,809.

Dixon, John: *See—*
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Dobedoe, Thomas J. L.; Robins, Ronald F.; and Brookes, Frederick J. Safety belt alarm system. 3,748,639, Cl. 340-52.00e.

Dobinson, Frank; and Pelezo, Chris A., to Monsanto Company. Aromatic-oxalic polyhydrazides and solutions thereof. 3,748,298, Cl. 260-32.6na.

Dobson, Le Roy E.: *See—*
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Doerksen, James L.: *See—*
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Doffingen, Hans Zeller: *See—*
Mauch, Harald; Handtmann, Dieter; Haug, Gerhard; Reichardt, Wolfgang; Doffingen, Hans Zeller; Zehender, Ernst; and Knapp, Heinrich, 3,747,577.

Donaldson, Asa Lynn; Jenkins, Gale D.; and Lemkin, Jack Lewis, to General Mills Fun Group, Inc. Coloring set. 3,747,232, Cl. 35-26.000.

Donelly Mirrors, Inc.: *See—*
van Putten, James D., Jr., 3,748,025.

Dormeyer, A. F., Manufacturing Co.: *See—*
Bishop, Walter F., 3,747,594.

Dorschner, Irvin E.: *See—*
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Dow Chemical Company, The: *See—*
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Schmidt, Donald L.; and Smith, Hugh B., 3,748,168.

Downey, Rogers B., to Polaroid Corporation. System for processing a strip of photographic material. 3,747,813, Cl. 222-541.000.

Dowty Rotol Limited: *See—*
Davis, David George Michael, 3,747,341.
Savery, Ralph, 3,747,913.

Draly, Edmund A. Buoyancy compensator. 3,747,139, Cl. 9-313.000.

Drew, Gene R., to United States of America, Navy. Load equalizing sling. 3,747,877, Cl. 244-139.000.

Du Pont de Nemours, E. I., and Company: *See—*
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Duffy, James J., to Ford Motor Company. Power steering gear mechanism. 3,747,471, Cl. 91-382.000.

Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., to Robbins Incubator Co. Egg rack and method of handling same. 3,747,568, Cl. 119-44.000.

Dulux Australia Ltd.: *See—*
Kershaw, Robert William; and Polgar, Livia, 3,748,294.

Duncan, John D. Nonselective asparagus harvester. 3,747,312, Cl. 56-327.00a.

Dunlop Holdings Limited: *See—*
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Dunn, John, to Peabody Engineering Corporation. Combustion control apparatus using a liquid spray. 3,748,080, Cl. 431-4.000.

Dunn, Robert H.; and Rasmussen, Robert F., to Lear Siegler, Inc., mesne. Liquid sealing means for a high pressure pump. 3,747,478, Cl. 92-86.000.

Dunsmore, Michael Robert Buchanan: *See—*
Baynham, Alexander Christopher; and Dunsmore, Michael Robert Buchanan, 3,748,605.

Dupee, Donald E.; and Hodgson, William S., to South Shore Machine Co., Inc. Fastener attaching machine. 3,747,828, Cl. 227-112.000.

Durakis, Manuel A.; Silver, David A.; and Destito, Frank P., to General Cable Corporation. Method of shielding high voltage solid dielectric power cables. 3,748,369, Cl. 174-36.000.

Durham, Henry B. Cable bender. 3,747,391, Cl. 72-387.000.

Durkoppwerke GmbH: *See—*
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Nicolay, Karl; and Goldbeck, Heinz, 3,747,545.

Dusa, Donald John: *See—*
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Dutch, Paul H. Portable testing kit for narcotics and dangerous and other drugs. 3,748,098, Cl. 23-253.00r.

Duval, Bruce, to T.P.I. Limited. Training devices. 3,747,230, Cl. 35-11.000.

Duval, Bruce, to T.P.I. Limited. Training devices. 3,747,231, Cl. 35-11.000.

Dyar, Dillard F. Automatic cleaning system for a habitable enclosure. 3,747,129, Cl. 4-1.000.

Dyckerhoff & Widmann Aktiengesellschaft, Firma: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
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Eastern Cyclone Industries, Inc.: *See—*
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Eckenrode, James H., to HMW Industries, Inc. Light control for timing displays. 3,747,322, Cl. 58-50.00r.

Eckenrode, James H., to HMW Industries, Inc. Light control for timing display. 3,747,323, Cl. 58-50.00r.

Edens, Ralph A. Tool holders. 3,747,946, Cl. 279-81.000.

Edholm, Paul Ragnvald; and Jacobson, Nils Bertil, to Medinova AB. Radiation absorbing device for radiographic apparatues. 3,748,487, Cl. 250-512.000.

Edo Corporation: *See—*
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Edwards, William F. Roll gate latch. 3,747,967, Cl. 292-104.000.

Egawa, Takeshi: *See—*
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Eggenberger, Markus A.; and Devlin, Charles L., to General Electric Company. Testing and monitoring system for redundant trip devices. 3,748,540, Cl. 317-135.00r.

Eggleston, Ernest: *See—*
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Eholzer, Ulrich: *See—*
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Eichardt, Wolfgang: *See—*
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Eickmann, Karl. Balancing arrangement for a control body having ports. 3,747,639, Cl. 137-625.240.

Eisele, Hermann; and Eichardt, Wolfgang, to Bosch, Robert, G.m.b.H. Load dependent control circuit for a gasoline fuel injection unit. 3,747,575, Cl. 123-32.0ea.

Eisenberg, Alvin S., to Q-TV, Inc. Closed circuit television prompting device. 3,748,384, Cl. 178-7.200.

Eisner, Olrich: *See—*
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Elam, Merrill Lynn: *See—*
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Elam, Thomas E., Sr., to Elam, Merrill Lynn. Apparatus for cooking hollow dough product. 3,747,508, Cl. 99-354.000.

Elco Corporation, mesne: *See—*
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Electric Machinery Mfg., Company: *See—*
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Electronic Image Systems Corporation: *See—*
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Ellis, William R.: *See—*
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Ellsworth, James P.; and Yorgin, Nick, to Westinghouse Electric Corporation. Circuit breaker with improved barrier means. 3,748,620, Cl. 337-20.000.

Elmer, Gary W.; and Muller, Karl A., Jr., to Standard Oil Company. Means for reducing foam accumulation in a separation drum. 3,747,304, Cl. 55-178.000.

Elmore, John O.: *See—*
Green, Irving C.; Rosales, Joseph G.; and Elmore, John O., 3,747,213.

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Energy Conversion Devices, Inc.: *See—*
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Engelbrecht, Nelly D. Dice game. 3,747,935, Cl. 273-138.00r.

Engelhardt, John Sherman; and Ebel, Lawrence Charles, to Anaconda Company, The, mesne. Temperature monitored cable system with telemetry read-out. 3,748,655, Cl. 340-207.00p.

Engfer, Ortwin, to Bosch, Robert, G.m.b.H. Apparatus for maintaining the pressure in a pneumatic suspension. 3,747,949, Cl. 280-124.00f.

Englander, Sol. Clamp-on mirror assembly. 3,747,891, Cl. 248-475.00r.

English Electric Valve Company Limited: *See—*
Pickering, Alan Hugh, 3,748,592.

Englund, Gosta R.; and Myren, Rune L., to Svenska Dataregister A.B. Indicating device for use in optical data sensing equipment. 3,748,483, Cl. 250-219.00d.

Enjoji, Hideo: *See—*
Nitta, Haruo; Sagawa, Natoshi; Enjoji, Hideo; Niwa, Kakuo; and Kume, Shinji, 3,748,074.

Ennelin, Kullervo: *See—*
Ruohola, Tuomo; Nyberg, Pauli Unto Juhani; Joutsen, Ero Oskari; and Ennelin, Kullervo, 3,747,542.

Enochain, Samuel H., to Unarco Industries, Inc. Pneumatic vehicle lading system mounted on swingable door. 3,747,954, Cl. 280-179.00r.

Eppstein, Anthony D.: *See—*
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.

Epstein, Paul; Wernikoff, Robert E.; Cunningham, James E.; and Rosen, George, to Electronic Image Systems Corporation. Run length coding technique. 3,748,379, Cl. 178-6.000.

Epstein, Peter F.; Caffrey, Joseph R.; and Yu, Pyung Kyung, to Chemagro Corporation. Quaternary thenyl ammonium salts. 3,748,343, Cl. 260-332.500.

Erickson, Robert W.; and Lindell, John F., to Koehring Company. Vehicle for underground installation of flexible utility lines and the like. 3,747,357, Cl. 61-72.600.

Erlichman, Stanton Roy; Woolf, Harold; and Baker, Norman, to Richards Manufacturing Company. Method and apparatus for making angle spark plug terminals. 3,747,190, Cl. 29-203.00d.

Eross, Bela, to Instrumentation Industries, Inc. Hose holder. 3,747,166, Cl. 24-81.0cc.

Esashi, Hanjiro; and Matsumoto, Tomio, to Sony Corporation. Tape cartridge case. 3,747,745, Cl. 206-52.00r.

Eschenbach, Paul W., to Deering Milliken Research Corporation. Package doffer mechanism. 3,747,421, Cl. 74-89.000.

Eskeli, Michael. Rotary compressor with cooling. 3,748,057, Cl. 415-116.000.

Eskelli, Michael. Reaction turbine. 3,748,054, Cl. 415-80.000.

Essex International Inc.: *See—*
Bauman, Patrick S., 3,747,629.

Esso Research and Engineering Company: *See—*
Miller, Alfred H., 3,748,360.
North, Howard C.; and Williamson, Charles W., 3,747,672.
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Etablissements Dalor: *See—*
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Ettl, Michael F. Ski carrier. 3,747,815, Cl. 224-45.00s.

Etudes et Fabrications Aeronautiques: *See—*
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Eufusia, Eugene A., to Optical Coating Laboratories, Inc. Servo system with electrically operated valve for maintaining a constant pressure. 3,747,634, Cl. 137-487.500.

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Evans, Pipeline Equipment Co.: *See—*
Cunningham, Joseph A., 3,747,394.

Evans, Robert D., to Dart Industries, Inc. Production of shaped magnesium oxide compositions. 3,748,282, Cl. 252-471.000.

Evzlin, Volf Nakhimovich: *See—*
Gilev, Vitaly Konstantinovich; Evzlin, Volf Nakhimovich; Sarkisov, Rafael Tevosovich; and Stepanian, Ernst Arakelovich, 3,747,452.

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Fabbrica Italiana Magneti Marelli S.p.A.: *See—*
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Fabricant, Norman, to Quaker Oats Company, The. Obstacle toy. 3,747,937, Cl. 273-153.00r.

Fabrique d'Horlogerie Chs. Tissot et Fils, S.A.: *See—*
Schneider, Jean-Claude, 3,747,325.

Falk, David O.: *See—*
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Fallacaro, Emmanuels: *See—*
Carbone, Angelo F., 3,747,448.

Fally, Jacques; Lazennec, Yvon; and Lasne, Claude, to Compagnie Generale d'Electricite. Electrochemical generator of the sulphur-sodium type. 3,748,178, Cl. 136-6.00f.

Faltex-Falzmaschinenfabrik AG: *See—*
Roda, Donato, 3,747,917.

Farfalett-Casali, Flaviano, to European Atomic Energy Community (Euratom). Insulation of gas feed tubes. 3,747,646, Cl. 138-148.000.

Farwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, 3,748,278.

Fathauer, Jack E.; and Gottlieb, Carl R., to Midland-Ross Corporation. Container-spreader spacing apparatus. 3,747,970, Cl. 294-81.0sf.

Faulhaber, Paul W., to Eastman Kodak Company. Chemical composition and process. 3,747,223, Cl. 34-9.000.

Fawkes, David Melville, to Imperial Chemical Industries, Limited. Process for dyeing polyester textiles. 3,748,091, Cl. 8-39.000.

Federated Department Stores, Inc.: *See—*
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Fedjukin, Dmitry Lvovich; Sergeeva, Ljudmila Semenovna; Bakharev, Andrei Nikolaevich; Korochkin, Petr Evmenovich; Aronov, Anatoly Izrailevich; Gorlina, Inna Leonidovna; Kravets, Arkady Timofeevich; Goloskov, Emmanuil Isaakovich; Annenberg, Ernest Alexandroich; Fedotova, Svetlana Evgenievna; and Bezverkhny, Grigory. Cutting tool for forming shaped articles. 3,747,281, Cl. 51-204.000.

Fedorova, Tamara Alexeevna: *See—*
Astapovich, Artem Ivanovich; Bogoljubov, Sergei Alexandrovich; Kuznetsov, Nikolai Ivanovich; Lupanov, Oleg Dmitrievich; Pustovarin, Ivan Yakovlevich; and Fedorova, Tamara Alexeevna, 3,747,183.

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Feenstra, Robijn; and Pols, Albert C., to Shell Oil Company. Diamond bit. 3,747,699, Cl. 175-329.000.

Fegley, Charles R.: *See—*
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Feichtmeir, Edmund F.: *See—*
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Fenne, Ivor, to C.A.V. Limited. Fuel injection systems. 3,747,857, Cl. 239-90.000.

Fennekers, Johan Barthus, to N.V. Industrielle Handelscombinatie Holland. Boat hull and method of constructing the same. 3,747,551, Cl. 114-79.00w.

Fenner, Erich: *See—*
Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 3,748,503.

Fenton, James E.; Samson, Rogelio G.; and Sebestyeh, Thomas M., to Ford Motor Company. Flame sensing system for a turbine engine. 3,747,340, Cl. 60-223.000.

Ferbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
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Feren, Conrad J.; and Squires, Robert W., to Lilly, Eli, and Company. Electrochemical device for chemical analysis. 3,748,245, Cl. 204-195.00p.

Ferguson, Robert M.; and Komp, Richard J., to Xerox Corporation. Multiple copy selective re-wetting printing. 3,748,126, Cl. 96-1.400.

Ferraz, Lucien, & Cie: *See—*
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Ferro Corporation: *See—*
Oswitch, Stanley; and Golownia, Robert F., 3,748,317.

Fertig, Raymond Baines: *See—*
Nickell, Lawrence Creigh; Fertig, Raymond Baines; Eggleston, Ernest; and Mitchell, Samuel Eugene, 3,747,372.

Feustel, James R.; and Van Wicklin, Warren A., Jr., to Ford Motor Company. Power steering system with auxiliary pump. 3,747,725, Cl. 180-79.20r.

Fibreboard Corporation: *See—*
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Fico, Louis; Sheker, Roger N.; Ballou, Raymond J.; and Cosman, David C., to Comtec Industries, Inc. Numerical base translator. 3,748,450, Cl. 235-155.000.

Filters International, Inc.: *See—*
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Finelli, Anthony F.: *See—*
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Finger, Ernest G. Modular building construction. 3,747,287, Cl. 52-18.000.
Finger, John F., to Sioux Steam Cleaner Corporation. Ignition failure shutdown apparatus. 3,748,083, Cl. 431-66.000.
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Finney, Frank E. Hydraulic auxiliary drive for vehicles. 3,747,722, Cl. 180-66.00r.
Finsterwalder, Klemens, to Dyckerhoff & Widmann Aktiengesellschaft, Firma. Device for measuring the anchoring forces in prestressed ground or rock anchors. 3,747,400, Cl. 73-88.00e.
Fischbein, Dave, Manufacturing Co., mesne: *See—*
Fischbein, Irving George; Fischbein, Harold; and Shark, Sam, 3,747,543.
Fischbein, Harold: *See—*
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Fischbein, Irving George; Fischbein, Harold; and Shark, Sam, to Fischbein, Dave, Manufacturing Co., mesne. Bag guiding assembly for bag closing machine. 3,747,543, Cl. 112-11.000.
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Fischer, Robert E.; Knapp, Wayne; and Wirtenson, George A., to Itek Corporation. Catadioptric optical system having multilayer filter reflector. 3,748,020, Cl. 350-199.000.
Fisher, Georg Aktiengesellschaft: *See—*
Wernli, Max, 3,747,912.
Fisher, Reed Edward; and Smith, John Nelson, to Bell Telephone Laboratories, Incorporated. Power combining network. 3,748,600, Cl. 333-10.000.
Fitzgerald, Timothy P.: *See—*
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Fitzmayer, Louis H., to General Electric Company. Built-in leakage radiation detecting device for a microwave oven. 3,748,424, Cl. 219-10.550.
Fletcher, Martin Wallace: *See—*
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Flint, Alan G., to Industrial Systems Corporation, mesne. Fluid bearing apparatus and method for handling and gaging articles. 3,747,753, Cl. 209-73.000.
Flinth, Rune Nils Allan: *See—*
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FMC Corporation: *See—*
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Fomm, Klaus Heinrich; and Barwicki, Werner, to VEB Polygrafischer Maschinenbau Leipzig, mesne. Method of and apparatus for rounding the spine of a book block. 3,747,145, Cl. 11-5.000.
Foote, J. B., Foundry Co., The: *See—*
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Ford, John A., Jr., to Eastman Kodak Company. Photographic compositions comprising light-sensitive polymers. 3,748,144, Cl. 96-115.00r.
Ford Motor Company: *See—*
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Fort, Eldon R.; Prescott, Basil O.; and Walters, Arley, to Shell Oil Company. Mapping hydrocarbon seepages in water-covered regions. 3,747,405, Cl. 73-170.00a.
Fortna, Steven L.; and Koroch, Ronald W., to McDonnell Douglas Corporation. Variable load feel. 3,747,876, Cl. 244-83.00d.
Fortsch, William A., to Thomas & Betts Corporation. Releasabe self-locking bundling strap. 3,747,164, Cl. 24-16.0pb.
Foseco International Limited: *See—*
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Foster, Berry W. Rotary vane device for compressor, motor or engine. 3,747,573, Cl. 123-8.050.
Foster, Elton Gordon. Swimming pool cover. 3,747,132, Cl. 4-172.140.
Foster, Michael N. Automatic film processing system and apparatus for X-ray film and the like. 3,747,499, Cl. 95-94.00r.
Foster Wheeler Corporation: *See—*
Berman, Irwin, 3,747,795.
Foufounis, Jean. Chronograph. 3,747,324, Cl. 58-126.00r.
Fouquet-Werk Frauz & Planck: *See—*
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Fouser, John P. Infant nursing dispenser. 3,747,791, Cl. 215-11.00r.
Fox, Sidney V.: *See—*
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Frank, Gilbert Haven; and Thomas, John L., to United States of America, Army, mesne. Regulated short circuit protected power supply. 3,748,569, Cl. 323-9.000.
Frank, John L., to Litton Business Systems, Inc. Loose-leaf binder mechanism. 3,748,051, Cl. 402-75.000.
Franklee, Ronald Harvey David, to Cooper, McDougall & Robertson, Limited. Cartridge for dispensing liquid. 3,747,805, Cl. 222-82.000.
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Frederick, Leonard L. Modular leads. 3,747,689, Cl. 173-90.000.
Freeman, Peter A., to Bowles Engineering Corporation. Fluidically controlled siphon. 3,747,643, Cl. 137-806.000.
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Fritzzell, Walter; and Gilliland, Quinton D. Automated handling of vessel heads. 3,747,380, Cl. 72-21.000.
Fromlath, Joseph J.; and Taylor, Forest E. Scaffold safety apparatus. 3,747,707, Cl. 182-129.000.
Frommeld, Hans-Dieter; and Rauhut, Herbert, to Keuffel & Esser Company, mesne. Light-sensitive diazotype material. 3,748,140, Cl. 96-91.00r.
Fry's Metals Limited: *See—*
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Fuchs, Otto; and Troster, Helmut, to Ferbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzoxanthene and benzothioxanthene-dicarboxylic acid triazinyl-imide dyestuffs. 3,748,330, Cl. 260-249.600.
Fuchs, Werner; and Kramer, Ulrich, to Sapal Societe Anonyme des Plieuses Automatiques. Apparatus on a packing machine for feeding and separating articles for packing. 3,747,739, Cl. 198-34.000.
Fuji Denki Seizo Kabushiki Kaisha: *See—*
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Fulmer Scott: *See—*
May, Gerald L.; and Fulmer Scott, 3,747,275.
Fulton Boiler Works, Inc.: *See—*
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G & H Technology, Inc.: *See—*
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Gabel, Heinz; and Lange, Gerhardt, to Messer Griesheim G.m.b.H. Torch for thermochemical processing of work pieces. 3,747,859, Cl. 239-418.000.

Gach, Peter P., to Sunbeam Plastics Corporation. Child-proof overcap for an aerosol can. 3,747,807, Cl. 222-153.000.

Gaczi, John: *See—*
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Gagnon, Robert A. Wheel driven articulated bulldozer. 3,747,265, Cl. 46-210.000.

Gainesville Machine Company, Inc.: *See—*
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Galbarini, Maso; and Ramusino, Francesco Cotta, to Innocenti Societa Generale per l'Industria Metallurgica e Meccanica. Suspension device for the headstock of a machine tool. 3,748,053, Cl. 408-234.000.

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Gall, Martin, to Upjohn Company, The. 2-[3-]1-(dimethylamino)alkyl[-1,5-dihydro-5-oxo-1 -substituted-4H-1,2,4-triazok-4-yl]benzophenone and process. 3,748,339, Cl. 260-308.00c.

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Gangl, Victor J.; and Skoog, Laurice G. Combination tool for fishermen. 3,747,253, Cl. 43-4.000.

Gangwisch, William J.; Trimmer, Robert Henry; and Gross, William Franklin, Jr., to Colgate-Palmolive Company. Compositions and methods for whitening and brightening laundry. 3,748,093, Cl. 8-137.000.

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Garbarini, Morries P.; and Spera, Edmond A. Telephone transmitter cut-off. 3,748,410, Cl. 179-167.000.

Gard, Andrew J. Pitch stabilization in papermaking. 3,748,220, Cl. 162-72.000.

Garnett, John Lyndon; and Dilli, Sergio. Production of cellulosic graft polymers or copolymers by the use of a mineral acid and radiation. 3,748,241, Cl. 204-159.120.

Garraty, William Clayton: *See—*
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Garrett, Henry U., to Brown Oil Tools, Inc. Automatic choke. 3,747,633, Cl. 137-489.300.

Garrison, Arthur D.; and Hall, Earl L., to Stromberg-Carlson Corporation. Flat panel video display device. 3,748,378, Cl. 178-5.40r.

Garte, Gilbert M. Work station with self-storing desk. 3,748,010, Cl. 312-314.000.

Gass, Edward W.; Hammond, Jack; Lorenzino, Paul; and Thomas, Joseph E., to Halliburton Company. Digital pulse count correction circuit. 3,748,446, Cl. 235-151.350.

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Russ, Paul E., Sr., 3,747,995.

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Gayner, Herbert; and Smith, David A., to Aluminum Company of America. Laminated container wall. 3,747,797, Cl. 220-53.000.

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George, Charles R., to Halliburton Company. High temperature cementing composition containing a lignosulfonic acid salt and a pentaboric acid salt. 3,748,159, Cl. 106-90.000.

Georges, Gerard: *See—*
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Gerosa, Augusto; and Martini, Marco, to Comitato Nazionale per l'Energio Nucleare. Fuel element for fast reactors with a device for exhausting the fission gases therefrom. 3,748,230, Cl. 176-78.000.

Gerstmann, Joseph; Morse, Richard S.; and Hoagland, Lawrence C., to Steam Engine Systems, Inc. Steam system. 3,747,333, Cl. 60-1.000.

Gervais, Edouard; Chollet, Pierre; and Ranger, Robert, to Noranda Mines Limited. Screw machining materials and method of preparing same. 3,748,188, Cl. 148-2.000.

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Gigantino, Otto M.; Parrill, Victor; and Gigantino, Leonard D., to Steinen, Wm., Mfg. Co. Magnetic valve. 3,747,892, Cl. 251-65.000.
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Gilchrist, Allan Boyd Earl, to SCM Corporation. Process and apparatus for electric cell treatment of liquor. 3,748,244, Cl. 204-180.00r.
Gilev, Vitaly Konstantinovich; Evzlin, Volf Nakhimovich; Sarkisov, Rafael Tevosovich; and Stepanian, Ernst Arakelovich. Automatic press for die blanking of two concentric parts from steel strips. 3,747,452, Cl. 83-132.000.
Gillett, Jimmie Douglas, to Electric Machinery Mfg., Company. A.C. motor speed control system for two individual limiting circuits therein. 3,748,556, Cl. 318-227.000.
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Girard, Dean C., 1/2 each to Guide Tube Inc. and LaForce, Jean. Composite consumable wire guide electrode. 3,748,434, Cl. 219-146.000.
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Glessner, Lee S. Motorized self-dumping ashtray. 3,747,609, Cl. 131-240.00r.
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Goings, Harford E. Dispenser for collapsible tubes. 3,747,806, Cl. 222-102.000.
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Golden, Boris A. Vaginal speculum. 3,747,591, Cl. 128-17.000.
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Graebe, Norbert H. Protective device. 3,747,952, Cl. 280-150.0ab.
Graffius, Kermit W. Dryer for athletic equipment. 3,747,226, Cl. 34-104.000.
Graham, Hugh S.; and Hughes, Charles R., to Bethleham Steel Corporation. Moving bed reactor. 3,747,764, Cl. 210-189.000.
Granning, Ole, to Granning Suspensions, Inc. Vehicle suspension. 3,747,948, Cl. 280-112.00r.
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Graser, Clarence F., to Westinghouse Electric Corporation. Ice cube storage container and dispenser. 3,747,810, Cl. 222-199.000.
Graser, Earl J., to Olinkraft, Inc. Returnable wrap-around. 3,747,801, Cl. 220-113.000.
Graser, Earl J., to Olinkraft, Inc. Wrap-around article carrier with secondary retention end panels. 3,747,835, Cl. 229-40.000.
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Gray, John W., to Singer Company, The. Sine cosine frequency tracker. 3,748,590, Cl. 331-12.000.
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Greck, Eugene, to American Flange & Manufacturing Co., Inc. Article handling system. 3,747,738, Cl. 198-33.0aa.
Greco, Alberto; Carbonaro, Antonio; and Asta, Geno Dall, to Goodrich, F. B., Company, The. Catalysts for preparing polycyclic unsaturated hydrocarbons. 3,748,279, Cl. 252-429.00b.
Green, Irving C.; Rosales, Joseph G.; and Elmore, John O. Sprinkler angular grass cutter. 3,747,213, Cl. 30-279.00r.
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Greenwood, Roger; and Van Bellen, Leo William, to International Telephone and Telegraph Corporation. Fluid flow control manifolds and devices. 3,747,623, Cl. 137-269.000.
Gregg, Rodman I., to Hercules Incorporated. Apparatus for scouring and blooming pile carpet. 3,747,375, Cl. 68-13.00r.
Gregory, Gerrett W., to Rohr Corporation. Automatic riveting device. 3,747,193, Cl. 29-243.530.
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Griffith, George L., to Commercial Solvents Corporation. Process and product. 3,747,527, Cl. 102-24.00r.

Grimelli, Nardie F. Double anchorage clamp. 3,747,288, Cl. 52-23.000.

Grimm, Bernard J., to General Electric Company. Regriferator including through-the-door ice service. 3,747,363, Cl. 62-377.000.

Grissino, Vincent. Board game apparatus. 3,747,932, Cl. 273-131.00b.

Groeber, Eugen, to Sperry Rand Corporation. Pneumatic transport track. 3,747,922, Cl. 271-74.000.

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Gross, William R. Apparatus for aerating water. 3,747,904, Cl. 261-92.000.

Grossan, Murray. Jet throat irrigation. 3,747,595, Cl. 128-66.000.

Grossberg, Sam, 50% to Friedman and Goodman. Pinwheel. 3,747,263, Cl. 46-58.000.

Grossman, James D.; Mookherjee, Braja D.; De Simone, Robert S.; and Theimer, Ernst T., to International Flavors & Fragrances Inc. Perfumes including perhydro 1,4,9,9-tetramethyl-4,7-methanoazulenones. 3,748,284, Cl. 252-522.000.

Grossman, Robert. Camera system for day and night use. 3,748,383, Cl. 178-7.200.

Grubb, John J.; and Tomei, Keichi, to Hamilton Company. Centrifuge rotor with sample holding means. 3,747,842, Cl. 233-26.000.

Gruber, William C. Burglary deterrent device. 3,748,490, Cl. 307-141.000.

Grunding E.M.V.: *See—*
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Gunther, Bogner; and Kuckuck, Helmut, to Siemens Aktiengesellschaft. Superconducting magnet coil. 3,748,615, Cl. 336-60.000.

Gunzel, Ernst Werner. Ski with adjustable device. 3,747,947, Cl. 280-11.13f.

Gutehoffnungshuette Sterkrade A.G.: *See—*
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Guthart, Leo A., to Alarm Device Manufacturing Company. Pulse relay apparatus. 3,748,610, Cl. 335-190.000.

Gwin, Richard B.; Ballis, William L.; Churchheus, Claude W.; and Hutt, Bruce L., to Columbia Gas System Service Corporation. Electric welding torch oscillator and guide. 3,748,433, Cl. 219-125.00r.

Gyongyos, Ivan; and Barzettes, Les, to Prolizenz AG. Machine with articulated mold sets for continuous casting of non-ferrous metals. 3,747,666, Cl. 164-279.000.

Haagensen, Duane B., to Matsushita Electric Industrial Co., Ltd. Microwave oven interpose system for control of environmental radiation. 3,748,423, Cl. 219-10.550.

Habers, Wihelmus, to Shell Oil Company. Atomizer for liquid fuel. 3,747,860, Cl. 239-431.000.

Hackett, Chester E. Hitching guide and shield. 3,747,958, Cl. 280-477.000.

Haddock, William A. Fishing lure. 3,747,256, Cl. 43-42.130.

Hadtke, Frederick B., to Becton, Dickinson and Company. Disposable Mayo stand cover. 3,747,655, Cl. 150-52.00r.

Haegert, Clarence B. Electrical connector and method of making same. 3,748,189, Cl. 148-3.000.

Haft, Harry H., to Westinghouse Electric Corporation. General illumination fluorescent lamp which the color of green objects. 3,748,517, Cl. 313-109.000.

Hagel, Ross J.: *See—*
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Hagen, Werner; and Diehl, Paul, to Maschinenfabrik Herborn Kommanditgesellschaft. Cooling arrangement for wire drawing machines. 3,747,388, Cl. 72-286.000.

Hager, Clarence H., to Modern Caster Co. Shock absorbing wheel suspension. 3,747,950, Cl. 280-124.00a.

Hagood, Jerry W.: *See—*
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Haigh, Jack M., to Standard Abrasives. Abrasive finishing article assembly. 3,747,286, Cl. 51-389.000.

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Hajicek, James D.; and Sipple, Ralph E., to Sperry Rand Corporation. Apparatus for performing a linear interpolation algorithm. 3,748,447, Cl. 235-152.000.

Hale, Douglas, to Ralston Purina Company. Process for the pigmentation of poultry. 3,748,147, Cl. 99-107.000.

Hall, Cyril John, to RCA Corporation. Vertical convergence circuit utilizing positive feedback for stabilization. 3,748,525, Cl. 315-13.00c.

Hall, Earl L.: *See—*
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Hall, Frank Kenneth. Method and apparatus for absorbing energy. 3,747,915, Cl. 267-139.000.

Hall, Gordon R. Flexible sectional wheel. 3,747,658, Cl. 152-97.000.

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Halpern, John Wolfgang. Fare charging apparatus for public transport systems. 3,748,441, Cl. 235-61.00r.

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Hamanaka, Ernest S., to Pfizer Inc. 6-(Sulfatoacylamino)penicillanic acids and esters thereof. 3,748,323, Cl. 260-239.100.

Hamilton Company: *See—*
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Hamilton, John G.; and Wallace, Joseph E., to International Business Machines Corporation. Low cost hammer unit. 3,747,521, Cl. 101-93.00c.

Hamilton, William R., Jr.: *See—*
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Hamm, Theodore, Brewing Co.: *See—*
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Hammond, Colin Edward. Cleaning phonograph records. 3,747,942, Cl. 274-47.000.

Hammond, Jack: *See—*
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Hankammer, Heinz, to Chemie Brita Geraete Ing. Karl Itter. Water treatment device. 3,747,767, Cl. 210-282.000.

Hankins, Charles William. Flap-opening apparatus. 3,747,297, Cl. 53-381.00r.

Hannah, Eric D., to Chevron Research Company. Method of improving detergency of alkylphenol polysulfonates by base precipitation and separation. 3,748,353, Cl. 260-512.00r.

Hannon, Paul. Horse twitch. 3,747,569, Cl. 119-96.000.

Hansen, Harold H. Vibrator for dump trucks. 3,747,980, Cl. 298-1.00v.

Hanson, Wallace E., to Champion International Corporation. Folding carton with partition and blank therefor. 3,747,831, Cl. 229-27.000.

Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Poultry picking machine. 3,747,159, Cl. 17-11.100.

Harbour, Philip F., to Westinghouse Electric Corporation. Control arrangement for refrigerator-freezer having fast chill feature. 3,747,361, Cl. 62-157.000.

Harder, Arthur J., Jr., to Coach and Car Equipment Corporation. Method for attaching cushion to rigid base. 3,747,178, Cl. 29-91.100.

Hardinge Brothers, Inc.: *See—*
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Hare, Terence G.; and McCormick, Hugh. Single handle faucet valve. 3,747,641, Cl. 137-625.410.

Harel, Abraham, to United States of America, Air Force, mesne. Cross-mounted mask changer with thickness monitoring. 3,747,558, Cl. 118-8.000.

Harkness, Benjamin F.; Humerickhouse, Billy J.; Matheis, Norbert E.; and Norris, Alfred W., to United States of America, Navy. Aircraft parachute flare having tapered core candle. 3,747,528, Cl. 102-35.000.

Harmon Electronics, Inc.: *See—*
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Harris, John Derek: *See—*
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Harris, Purdy & McIntosh Limited: *See—*
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Harris, Robert J.; and Sikes, Gail T., to Price, H. C., Co. Handling apparatus for couplings used in application of pipe coatings. 3,747,192, Cl. 29-237.000.

Harris-Intertype Corporation: *See—*
Crum, James N., 3,747,524.
Murray, James Emmett, 3,748,046.

Harrison, Larry; Vanvalkinburgh, Robert; and Kalviiis, Robert, to Xerox Corporation. Reaction time testing apparatus. 3,747,589, Cl. 128-2.00n.

Harte, James Richard. Manual self-instructional and self-testing device. 3,747,229, Cl. 35-9.00r.

Hartkopf, Heinz, to Kieserling, Th., & Albrecht. Straightening apparatus for elongated tubular and rod stock. 3,747,386, Cl. 72-99.000.

Hartman, Arie W., to General Electric Company. Automatic electron microscope field counter. 3,748,468, Cl. 250-311.000.

Hartung, Dudley B. Speed limiter and alarm for internal combustion engine. 3,748,641, Cl. 340-53.000.

Hartzell, George W.; and Gunnerman, Robert J., to Hartzell Industries, Inc. Sawmill. 3,747,455, Cl. 83-403.100.

Hartzell Industries, Inc.: *See—*
Hartzell, George W.; and Gunnerman, Robert J., 3,747,455.

Harvey, Donald M., to Eastman Kodak Company. Device for locating a film transparency. 3,748,033, Cl. 353-60.000.

Harvey, Donald M., to Eastman Kodak Company. Photographic film unit assembly. 3,748,139, Cl. 96-76.00c.

Harvey, John W., to United Aircraft Corporation. Method and apparatus for determining exact shrink and stretch limits in rubber pad forming of curved flanged members. 3,747,389, Cl. 72-375.000.

Harvey, R. J., Instrument Corporation: *See—*
Harvey, Robert J.; and D'Imperio, Angelo G., 3,747,809.

Harvey, Robert J.; and D'Imperio, Angelo G., to Harvey, R. J., Instrument Corporation. Clamping means for flexible dispensing conduits. 3,747,809, Cl. 222-183.000.

Hashimoto, Masashi: *See—*
Kamiya, Takashi; and Hashimoto, Masashi, 3,748,341.

Hashmi, Zia; and McNitt, David H., to Ford Motor Company. Charged particle beam deflection control yoke. 3,748,612, Cl. 335-210.000.

Hasselwander, Ray W.: *See—*
Lewis, Karl D.; Hasselwander, Ray W.; and Amann, William Leon, 3,747,811.

Hastings, Donald R.; Scarbrough, Don R.; Tamny, Simon Z.; and Wilhelm, Frederick R., to Nordson Corporation. Electrostatic spray gun. 3,747,850, Cl. 239-3.000.

Hattori, Keisuke: *See—*
Kawamura, Tamotsu; Yamashita, Kazuo; Hattori, Keisuke; and Ito, Yoshinao, 3,748,175.

Hattori, Tadashi: *See—*
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Haubold, Herbert: *See—*
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Haug, Gerhard: *See—*
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Hause, Gilbert K., to General Motors Corporation. Power package. 3,747,436, Cl. 74-730.000.

Hause, Gilbert K., to General Motors Corporation. Three-speed transmission and controls. 3,747,730, Cl. 192-87.110.

Hauser, Hans, to Foote, J. B., Foundry Co., The. Engine and transmission with safety system. 3,747,437, Cl. 74-850.000.

Hausske, Gene W.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,747,568.

Hawes, Roland C., to Cary Instruments. High resolution or high bandwidth monochromator. 3,748,040, Cl. 356-101.000.

Hawxhurst, John Elmer, to International Business Machines Corporation. Forms feeding device. 3,747,820, Cl. 226-76.000.

Hayes, Charles M., to Universal Oil Products Company. Bis-imides of polyhalo substituted polyhydropolycyclicdicarboxylic acids. 3,748,340, Cl. 260-326.00c.

Hayes, Charles W., to United Aircraft Corporation. Method of fabricating a hollow turbine blade having an insert therein. 3,747,182, Cl. 29-156.80h.

Hayes, John C., to Universal Oil Pruducts Company. Reforming a sulfur-free gasoline fraction with a platinum-germanium catalyst. 3,748,260, Cl. 208-139.000.

Hayes, Raymond: *See—*
Culter, Robert Gordon; Hayes, Raymond; and Sang, Emmanuel, 3,748,585.

Hazzard, Robert D.; Trotter, Peter H.; Schlein, Kai Frederik; and Clute, Angelo. Closure controlling means and method. 3,748,011, Cl. 312-333.000.

Heath, Thomas C., to General Electric Corporation. Relay. 3,748,611, Cl. 335-197.000.

Heberlein, Harold V. Spherical vehicle. 3,747,956, Cl. 280-206.000.

Hebrew University of Jerusalem, The: *See—*
Alon, Yosef, 3,748,599.

Heck, Peter J.: *See—*
Chovanec, William; and Heck, Peter J., 3,748,005.

Heckett, Frank A. Resiliently mounted vehicle seat. 3,747,888, Cl. 248-373.000.

Hedin, Robert A.; and Balzano, Alfiero F. Sound activated controller. 3,748,496, Cl. 307-252.00w.

Heierli, Werner. Control device for a heating installation. 3,747,849, Cl. 236-91.000.

Heimann, Egon. Index tab. 3,747,242, Cl. 40-2.00r.

Heimburg, Erhardt H., to Industrial Electronic Timer Company. Control system. 3,748,542, Cl. 317-141.00s.

Heimerl, Joseph, to Leybold-Heraeus——Verwaltung G.m.b.H. Apparatus for preparing pellets from a melt. 3,748,070, Cl. 425-6.000.

Heinrich, Peter, Jr., to Marvel Engineering Company. Continuous flow suction filter. 3,747,761, Cl. 210-120.000.

Heisler, Clarence J. Auxiliary tool adapter for electric hand saws. 3,747,650, Cl. 144-1.00e.

Heit, Allyn H.; and Williamson, James N., to Sybron Corporation. Electrolytic process for the preparation of sodium hydrosulfite. 3,748,238, Cl. 204-92.000.

Helm, Eugene C., to General Motors Corporation. Vacuum processing machine. 3,747,740, Cl. 198-209.000.

Helm, Herbert W., to Smithe, F. L., Machine Company, Inc. Adhesive application mechanism for envelope processing machinery. 3,747,561, Cl. 118-259.000.

Hemminghaus, Uwe: *See—*
Dietzel, Walter; Matusch, Siegfried; and Hemminghaus, Uwe, 3,747,943.

Henderson, James B., to Bell & Howell Company. Film control in motion picture projectors. 3,748,030, Cl. 352-124.000.

Henderson, James R.; Johnson, Donald M.; and Muramoto, Michiya, to McDonnell Douglas Corporation. Production of high purity rare earth sulfides. 3,748,095, Cl. 423-21.000.

Hendrickson, Richard T., to Bendix Corporation, The. Hydraulic power brake booster actuated trailer brake system. 3,747,987, Cl. 303-7.000.

Hennecke, Rudolf: *See—*
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Henquet, Andre Jean; and Mugnier, Roger, to International Standard Electric Corporation. Central metering system for automatic telephone exchanges. 3,748,392, Cl. 179-7.0mm.

Henrich, Donald A., to Outboard Marine Corporation. Propeller construction. 3,748,061, Cl. 416-93.000.

Henriksen, Elmer C. Projector for automatically threading, rewinding and indexing a plurality of film spools and a magazine for use therewith. 3,747,871, Cl. 242-181.000.

Henry, A. P.: *See—*
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Henry, Charles Howard; and Kukimoto, Hiroshi, to Bell Telephone Laboratories, Incorporated. Method for determining concentration profiles of deep levels on both sides of a P-N junction. 3,748,579, Cl. 324-158.00d.

Herbert, Paul Sanford; and Shearon, Michael Hillas, to Du Pont de Nemours, E. I., and Company. Surface treatment of fried frozen food with superheated steam. 3,748,153, Cl. 99-193.000.

Hercock, Robert James; and Lindsay, Simon, to Ilford Limited. Color electrophotography using toners of the repellent type. 3,748,125, Cl. 96-1.200.

Hercules Incorporated: *See—*
Gregg, Rodman I., 3,747,375.
Josephson, Roy R., 3,748,350.

Herrmann, Kurt; and Noss, Kornelius, to Siemens Aktiengesellschaft. Light-optical apparatus for drafting very small figures with very fine line widths and/or extremely short line lenghts. 3,747,486, Cl. 95-12.000.

Herter, Eberhard, to International Standard Electric Corporation. D.C. monitor circuit. 3,748,395, Cl. 179-18.0fa.

Herzog, William F.: *See—*
Monney, Daniel L.; and Herzog, William F., 3,748,386.

Hestad, Alfred M.; Marbury, Benjamin R.; Medina, Hector O.; and Neel, Donald L., to International Telephone and Telegraph Corporation. Direct inward dialing trunk circuit. 3,748,396, Cl. 179-18.0da.

Hettich, Alfred: *See—*
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Hetzel, Marvin E.: *See—*
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Heyes, Roger Wallace; Betts, Malcolm Charles; and Cranswick, Helen Barbara, to International Standard Electric Corporation. Carrier supervisory arrangements. 3,748,411, Cl. 179-170.00a.

Heywang, Walter: *See—*
Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 3,748,503.
Guntersdofer, Max; and Heywang, Walter, 3,748,504.

Heywang, Walter; and Guntersdorfer, Max, to Siemens Aktiengesellschaft. Clock drive with piezoelectric tuning fork. 3,747,326, Cl. 58123.0tf.

Hiatt, Wilbur L. Combination lock and fuel cut-off valve apparatus. 3,747,378, Cl. 70-257.000.

Hill, Brian, to International Nickel Company, Inc., The. Nickel-cobalt aluminate pigments. 3,748,165, Cl. 106-300.000.

Hill, Robert H.: *See—*
Wallace, James B.; Maier, Alfred E.; and Hill, Robert H., 3,748,609.

Hillekum, Heinz; and Lange, Ludwig, to Interatom Internationale Atomreaktorbau GmbH. Containment system for a sodium cooled reactor. 3,748,227, Cl. 176-38.000.

Hinger, Fred D. Musical instrument for the percussion type. 3,747,463, Cl. 84-419.000.

Hinkle, Joseph D., to Dam Fine Products Corporation. Griddle. 3,747,509, Cl. 99-422.000.

Hinzmann, Dieter: *See—*
Goes, Friedrich; Seiffert, Ulrich; Hinzmann, Dieter; and Borenius, Gunnar, 3,747,953.

Hiraoka, Hiroyuki, to International Business Machines Corporation. Preparation of cyclobutanones from glutaric anhydrides. 3,748,242, Cl. 204-158.00r.

Hirvela, Veikko Adolph: *See—*
McDermott, William Francis; Plaistow, Joseph James; and Hirvela, Veikko Adolph, 3,747,411.

Hitchcock, Kenneth O. Folding boom assembly. 3,747,148, Cl. 74-101.000.

HMW Industries, Inc.: *See—*
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Eckenrode, James H., 3,747,323.

Ho, Edward J.: *See—*
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Hoagland, Earl J., to Standard Safety Equipment Co. Collapsible hermetic sealing joint for garments. 3,747,126, Cl. 2-270.000.

Hoagland, Lawrence C.: *See—*
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Hodgson, William S.: *See—*
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Hodgson, William S., to South Shore Machine Co., Inc. Apparatus and method for assembling brushes and the like. 3,747,983, Cl. 300-21.000.

Hodshire, James O.; Shockley, Quentin O.; and Martin, Robert, Jr., to General Motors Corporation. Ductile-corrosion resistant coating for nickel base alloy articles. 3,748,110, Cl. 29-197.000.

Hoff, Stephen J., to Hoffco, Inc. Mini bike drive kit. 3,747,721, Cl. 180-33.00b.

Hoffco, Inc.: *See—*
Hoff, Stephen J., 3,747,721.

Hoffman, Arnold; and Zuckerman, Bernard, to Polaroid Corporation. Novel photographic products and processes. 3,748,130, Cl. 96-29.00d.

Hoffman, Arthur H., to Westinghouse Electric Corporation. Protective circuit for brushless synchronous motors. 3,748,555, Cl. 318-181.000.

Hoffman, Hendrik: *See—*
Jansen, Johan Wilhelm; and Hoffman, Hendrik, 3,747,468.

Hoffman, J. Brooks. Golf tee. 3,747,927, Cl. 273-33.000.

Hoffman, Jay; Weber, Raymond E.; and De Cottis, Constant J., to Singer Company, The, mesne. Fluidic inertial platform. 3,747,418, Cl. 74-5.430.

Hoffmann, George A., Jr., to Certain-Teed Saint Gobain Insulation Corporation. Insulation package. 3,747,743, Cl. 206-46.00r.

Hoffmann, Kurt, to American Micro Systems, Incorporated. Low voltage quasi static flip-flop. 3,748,498, Cl. 307-279.000.

Hofmann, Wilfried: *See—*
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Hofmeister, Lucien A., to Raytheon Company. Semiconductor lead bonding machine. 3,747,829, Cl. 228-29.00.

Hojyo, Yasuo: *See—*
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Holce, Thomas J.: *See—*
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Hollander, Kurt W. Magnetically actuated mechanical positioning apparatus. 3,747,728, Cl. 192-58.00a.

Holly, James A.; and Schneider, Edmund, to Hollymatic Corporation. Molding apparatus. 3,747,160, Cl. 17-32.000.

Hollymatic Corporation: *See—*
Holly, James A.; and Schneider, Edmund, 3,747,160.

Holm, William J., to Riggs & Lombard, Inc. Self-calibrating seam detector. 3,748,414, Cl. 200-61.130.

Holster, Peter Leendert; and Smulders, Hendricus Franciscus Gerardus, to U.S. Philips Corporation. Fluidic function module for use in a system for constructing fluidic circuits. 3,747,628, Cl. 137-269.000.

Holster, Peter Leendert; Smulders, Hendricus Franciscus Gerardus; and Baert, Roger Bertrand, to U.S. Philips Corporation. Fluid control device. 3,747,645, Cl. 137-838.000.

Holtmyer, Marlin D.: *See—*
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Holtz, Hermann. Magnetic board. 3,748,614, Cl. 335-285.000.

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Honda, Kazuhiko: *See—*
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Honda, Osamu; and Honda, Hiroshi. System and method for climate control in greenhouses. 3,747,501, Cl. 98-33.00a.

Honeywell Information Systems, Inc.: *See—*
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Hoopengardner, Merle R. Carpet tape dispenser. 3,748,211, Cl. 156-575.000.

Horlach, Heinz Eric, to Toluca Industries Corporation. Liquid handling device. 3,748,099, Cl. 23-259.000.

Hornsby, Guyton Ellis. Automobile cushion bumper. 3,747,968, Cl. 293-88.000.

Horvath, Joseph L., 50% to Beecroft, Roland J. Orbiter with rocking motion. 3,747,419, Cl. 74-22.000.

Hosler, Peter; and Raymond, Richard L., to Sun Research and Development Co. Microbiological oxidation of alkyl-substituted cyclic compounds. 3,748,231, Cl. 195-28.00r.

Houk, William A., to General Motors Corporation. Engine mount. 3,747,879, Cl. 248-9.000.

Houlihan, William J.: *See—*
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Howlett, William. Candy Box. 3,747,836, Cl. 229-42.000.

Huber, Walter E., to Dayco Corporation. Track section and endless track using same. 3,747,996, Cl. 305-38.000.

Hudson, Leslie Gordon. Method of perforating tubes. 3,747,450, Cl. 83-30.000.

Hughes Aircraft Company: *See—*
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Hughes, Charles R.: *See—*
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Hugoson, Birger O.; and Vettel, Norbert, to Westinghouse Electric Corporation. Sideplate for turbine blade. 3,748,060, Cl. 416-92.000.

Humerickhouse, Billy J.: *See—*
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Hummell, John D., to PPG Industries, Inc. Method and apparatus for disposal of liquid waste. 3,748,081, Cl. 431-7.000.

Humpage, Roy William: *See—*
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Hunsucker, Jerry H.; and Mudd, Daniel, to Commercial Solvents Corporation. Polyester resins from polyolamines and phthalic acids. 3,748,309, Cl. 260-75.00n.

Hunt, John T., to United States of America, Atomic Energy Commission, mesne. Nuclear fuel element identification method. 3,747,959, Cl. 283-7.000.

Hurrell, Ronald Arthur. Plate valves. 3,747,630, Cl. 137-312.000.

Hurricane International: *See—*
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Hurst, James A. Adhesive tape dispenser and tube former. 3,747,483, Cl. 93-80.000.

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Hutt, Clyde B. Collapsible side rail assembly for hospital bed. 3,747,133, Cl. 5-331.000.

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Hwang, Paul Y.; and Arvin, Earl F., to Ampex Corporation. Process of making acicular, stable magnetic iron particles. 3,748,119, Cl. 75-.5aa.

Hwang, Paul Y., to Ampex Corporation. Method of preparing cobalt doped magnetic iron oxide particles. 3,748,270, Cl. 252-52.560.

Hymatic Engineering Company, Limited, The: *See—*
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I-T-E Imperial Corporation: *See—*
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Iida, Yozo, to Nippon Kogaku K.K. Film rewind device for compact cinecameras. 3,748,028, Cl. 352-91.000.

Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, to Kyodo Insatsu Kabushiki Kaisha. Process for manufacturing reprinted matter (relief printing). 3,748,202, Cl. 156-59.000.

Ikor Incorporated: *See—*
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Ilford Limited: *See—*
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Ingwersen, Larry D., to Control Data Corporation. General purpose matric processor with consolution capabilities. 3,748,451, Cl. 235-156.000.

Inman, Richard B., to Trimble House Corporation. Security mounting for plastic globes or the like. 3,747,883, Cl. 248-187.000.

Inmont Corporation: *See—*
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Inoue, Gentei; Sato, Chuichi; and Tanaka, Mamoru, to Nippon Seiko Kabushiki Kaisha. Spindle provided with an anti-vibration mechanism. 3,747,470, Cl. 90-11.00a.

Institutul de Cercetari Metalurgice: *See—*
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Itek Corporation: *See—*
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Ito, Akira, to Tokyo Shibaura Electric Co., Ltd. Glass melting apparatus. 3,748,113, Cl. 65-335.000.

Ito, Shin: *See—*
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Ito, Takamitsu: *See—*
Mizutani, Norio; Sasaki, Ichiro; Ito, Takamitsu; Ueno, Hiroshi; Nishizaki, Shoichi; and Ishizuka, Tetsuo, 3,748,324.

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Ito, Yoshinao: *See—*
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Ivernel, Alix, to L'Air Liquide, Societe Anonyme pour l'Etude et Exploitation des Procedes Georges Claude. Method for cracking and burning hydrocarbons. 3,748,082, Cl. 431-8.000.

Iwasaki, Tadahisa, to Pioneer Electronic Corporation. Tape cartridge exchanging device. 3,747,939, Cl. 274-4.00f.

Jackson, Lowell L.: *See—*
Bosworth, Thomas J.; and Jackson, Lowell L., 3,748,432.

Jackson, Robert L., to American Air Filter Company, Inc. Dual gluing filter. 3,747,773, Cl. 210-495.000.

Jacobs, James W., to General Motors Corporation. Internally-actuated taillight system. 3,748,643, Cl. 340-71.000.

Jacobs, Philip C., Jr.: *See—*
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Jansen, Johan Wilhelm; and Hoffman, Hendrik, to Huygmentaal N.V. Anchor bolt. 3,747,468, Cl. 85-79.000.

Jany, Johann, to Baufa-Werke Richard Rinker. Landmine with pressure trigger. 3,747,526, Cl. 102-8.000.

Jason, Robert C.: *See—*
Kiley, John S.; and Jason, Robert C., 3,747,748.

Jeanmart, Claude; Messer, Mayer Naoum; and Simon, Pierre, to Rhone-Poulenc S.A. Palladium hydrogenation process for 3,4 dihydroisoquinolines. 3,748,333, Cl. 260-286.00r.

Jehle, Heinrich. Method of producng sausage suitable for dietary purposes. 3,748,148, Cl. 99-109.000.

Jellinek, John. Vehicle having plural modes of propulsion. 3,747,717, Cl. 180-6.500.

Jendis, Anneliese: *See—*
Ritz, Hermann; Gorlitz, Hans; and Jendis, Anneliese, 3,748,400.

Jenkins, Gale D.: *See—*
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Jensen Enterprises, Inc.: *See—*
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Jensen, Iwer F., to Brit-Jen Tool Co., Inc. Adjustable high speed bit. 3,748,052, Cl. 408-188.000.

Jensen, Melville Leroy, to Jensen Enterprises, Inc. Hub insert for rear wheel assemblies of motorcycles to receive and transmit driving power. 3,747,720, Cl. 180-33.00r.

Jensen, Paul K., to SSR Instruments, Company. Method and apparatus for detecting a faint energy source. 3,748,478, Cl. 250-207.000.

Jensen, Wayne Emil. Tire peeling device. 3,747,177, Cl. 29-78.000.

Jernqvist, Ake: *See—*
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Johns-Manville Corporation: *See—*
Lkdahl, Wendell Graydon, 3,747,760.

Johnsen, Raymond K., to Rohr Corporation. Ejector nozzle having primary nozzles communicating with exhaust gases in plenum chamber. 3,747,874, Cl. 244-53.000.

Johnson & Johnson: *See—*
Kalwaites, Frank, 3,747,161.

Johnson, Anderson F., Jr.: *See—*
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Johnson, Clarence S. Boiler tube end-fitting assembly. 3,747,572, Cl. 122-511.000.

Johnson, David G.: *See—*
Woerman, Delwin G.; Johnson, David G.; and Murphy, Donald F., 3,747,688.

Johnson, Delmar R.; and Precin, Raymond J., to Ampex Corporation. Tape transport with constant take-up tension. 3,747,872, Cl. 242-206.000.

Johnson, Derwyn C., to Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence. Energy meter using gas as an energy absorber. 3,747,401, Cl. 73-190.00r.

Johnson, Donald M.: *See—*
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Johnson, Edward L.; Buggs, Ralph N.; and Kornmann, Richard L., to Nalco Chemical Company. Sacrificial electrode system for removal of heavy metal ions from waste water. 3,748,240, Cl. 204-149.000.

Johnson, John A., to Year-A-Round Cab Corporation. Door closure structure. 3,747,273, Cl. 49-394.000.

Johnson, Matthey & Co., Limited: *See—*
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Johnson, Robert A.; and Stump, Theodore M., to Collins Radio Company. Frequency discriminator utilizing mechanical filter. 3,748,586, Cl. 329-104.000.

Johnson, Robert H.: *See—*
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Johnson, Rowland E.: *See—*
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Jones, Alan L.; and Judson, George T., to International Business Machines Corporation. Centrifuge fluid container. 3,748,101, Cl. 23-259.000.

Jones, Alan Richardson, to Coulter Electronics, Inc. Sample mixing and metering apparatus. 3,747,412, Cl. 73-423.00a.

Jones, Charles Elmer, Jr., to Bell Telephone Laboratories, Incorporated. Continuous monitoring of eccentricity and coaxial capacitance variables during electrical insulation extrusion. 3,748,577, Cl. 324-61.00r.

Jones, Clarence E. Portable remote broadcasting telephone system. 3,748,397, Cl. .

Jones, David Ian: *See—*
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Jones, Edward Barry, to Du Pont de Nemours, E. I., and Company. Flame-retarded acrylonitrile fibers. 3,748,302, Cl. 260-41.00b.

Jones, Lawrence Temple: *See—*
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Jones, Rexford W.; and Thompson, William B., to Staley, A. E., Manufacturing Company. Treatment of frostable light sensitive organic layers with water vapor, after exposure, for obtaining frosted images in unexposed areas. 3,748,134, Cl. 96-48.0hd.

Jones, Robert J.: *See—*
Burns, Eugene A.; and Jones, Robert J., 3,748,307.
Burns, Eugene A.; and Jones, Robert J., 3,748,310.
Burns, Eugene A.; and Jones, Robert J., 3,748,311.
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Jones, Roy W., to Stromberg-Carlson Corporation. Filter-control circuit. 3,748,534, Cl. 317-12.00b.

Jones, William E.; Halpin, Donald A.; and Biese, Joseph J., to Ingersoll-Rand Company. LTR condenser. 3,747,673, Cl. 165-67.000.

Jones, William M. Fluid flow control system. 3,747,631, Cl. 137-318.000.

Jordan, John A.: *See—*
Perigo, Leon A.; and Jordan, John A., 3,747,291.

Jordan, John Robert, to Honeywell Information Systems, Inc. Method of making beam leads on substrates. 3,747,202, Cl. 29-577.000.

Jordan, Robert K., to General Motors Corporation. Air-filter and carbon-bed element for an air cleaner assembly. 3,747,303, Cl. 55-318.000.

Jordan, Wesley A., to General Mills Chemicals, Inc. Thickening compositions containing xanthomonas gum and hydroxyalkyl ether of guar gum. 3,748,201, Cl. 149-109.000.

Josephson, Roy R., to Hercules Incorporated. Coupling with a palladium salt. 3,748,350, Cl. 260-475.00r.

Joslin, Frederick R., to United Aircraft Corporation. Electrode for small hole electrochemical machining. 3,748,252, Cl. 204-284.000.

Joutsen, Ero Oskari: *See—*
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Joyce, John E., to Damon Corporation. Continuous flow zonal rotor. 3,747,843, Cl. 233-32.000.

Joyner, Charles D., Jr. Removable dental crown. 3,747,215, Cl. 32-13.000.

Judson, George T.: *See—*
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Julia, Marc, to Rhone-Poulenc S.A. Intermediates useful in the synthesis of vitamin A. 3,748,347, Cl. 260-402.000.

Jurgens, Erwin, to Union Special Maschinenfabrik G.m.b.H. Blind-stitch sewing machine. 3,747,546, Cl. 112-178.000.

Justman, Dan B., to Murphy, G. W., Industries, Inc. Rotary cutter for earth boring bits. 3,747,999, Cl. 308-15.000.

K-Tel International Inc.: *See—*
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Kabushiki Kaisha Koishikawa Shokai: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
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Kadison, Leon A.; and Maguire, Eileen, to Crown City Plating Company. Electroless plating process employing solutions stabilized with sulfamic acid and salts thereof. 3,748,166, Cl. 117-47.00a.

Kah, Carl L. C., Jr. Irrigation sprinkler system control employing pilot operated, pressure actuated and sequenced valve assemblies. 3,747,620, Cl. 137-119.000.

Kaimoto, Masahiro: *See—*
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Kain, Calvin L. Fluid treating system. 3,747,763, Cl. 210-181.000.

Kaiser Aluminum & Chemical Corporation: *See—*
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Kaiserswerth, Hans-Peter; and Seiler, Viktor, to Siemens Aktiengesellschaft. Radio frequency choke. 3,748,618, Cl. 336-178.000.

Kakizawa, Kouji: *See—*
Yamamura, Katsumi; Kakizawa, Kouji; and Yamazaki, Yoshio, 3,748,017.

Kalikow, Peter. Box forming machine. 3,747,480, Cl. 93-51.00r.

Kalle Aktiengesellschaft: *See—*
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Porrmann, Herbert; Klenk, Ludwig; and Loffler, Manfred, 3,747,174.

Kalthoff, Carl-Heinz; Freis, Wilhelm; and Wilczynski, Peter, to Aktiengesellschaft des Altenbergs fur Bergbau und Zinkhuttenbetrieb. Method and machine for flotation of minerals or the like. 3,747,757, Cl. 209-164.000.

Kalviiis, Robert: *See—*
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Kalwaites, Frank, to Johnson & Johnson. Method for producing a rearranged fabric having improved cross-strength. 3,747,161, Cl. 19-161.00p.

Kamiya, Takashi; and Hashimoto, Masashi, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. Process of preparing 1-substituted-2-aminomethyl-pyrrolidines and intermediates therefor. 3,748,341, Cl. 260-326.800.

Kan, Peter T.: *See—*
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Kane, Edward, to Kane Manufacturing Company. Adjustable storage rack. 3,747,777, Cl. 211-176.000.

Kane Manufacturing Company: *See—*
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Kapinos, Lawrence E., to United States of America, Navy. Control system for flexible seal movable nozzle. 3,747,342, Cl. 60-232.000.

Kaplan, Sam H., to Zenith Radio Corporation. Color television picture tube with subtractive color filters. 3,748,515, Cl. 313-92.00b.

Karcher, Walter, to Bosch, Robert, G.m.b.H. Vehicle power supply arrangement with discrete rectifier unit. 3,748,509, Cl. 310-68.00d.

Karklins, Arnold: *See—*
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Karman, Harvey; Robins, Milton; and Wolf, Leo, to Medical Concepts, Inc. Syringe. 3,747,812, Cl. 222-387.000.

Karpinski, Janusz M.: *See—*
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Katchka, Jay R., to Robertshaw Controls Company. Dual lever mechanisms and method of calibration thereof. 3,747,617, Cl. 137-66.000.

Kato, Minour, to Nippondenso Co., Ltd. Ignition system for multicylinder internal combustion engine. 3,747,582, Cl. 123-148.00e.

Katsurada, Yasuo: *See—*
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Katzke, Ernest F. Apparatus for polishing wafers. 3,747,282, Cl. 51-235.000.

Kaufman, Stanley; Lutchansky, Milton; and Sabia, Raffaele Antonio, to Bell Telephone Laboratories, Incorporated. Waveguide structure utilizing compliant continuous support. 3,748,606, Cl. 333-95.00r.

Kawabe, Kunitsugu: *See—*
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Kawamura, Tamotsu; Yamashita, Kazuo; Hattori, Keisuke; and Ito, Yoshinao, to Tokai Togyo Co., Ltd. Process for preparing crystalline, anhydrous beta-dextrose. 3,748,175, Cl. 127-60.000.

Kawasaki, Kikuo, to Fuji Denki Seizo Kabushiki Kaisha. Tank-type gas-filled circuit breaker with impulsive seal breaking means for initiating piston operation. 3,748,418, Cl. 200-82.00b.

Kawasaki, Masahiro, to Matsubishi Jukogyo Kabushiki Kaisha. Shipyard. 3,747,189, Cl. 29-200.00a.

Kawasaki Steel Corporation: *See—*
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Kawashima, Kazumi, to Matsushita Electric Industrial Co., Ltd. Channel selector. 3,748,645, Cl. 340-168.00r.

Kaystone Consolidated Industries, Inc.: *See—*
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Keeshin, Ira A.; and Kruse, Ronald J., to Federated Department Stores, Inc. Mobile tool concession cart. 3,748,437, Cl. 219-214.000.

Kellam, Anne Marie. Article of animal apparel. 3,747,565, Cl. 119-1.000.

Keller Corporation, The: *See—*
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Keller, Leonark J., to Keller Corporation, The. Rotary vane device. 3,748,068, Cl. 418-137.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for the production of hollow members of any length of semiconductor material. 3,748,169, Cl. 117-106.00a.

Kellogg Company: *See—*
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Kemeny, George A., to Westinghouse Electric Corporation. Method of utilizing heat and pressure to cure flaws in metal pieces. 3,748,196, Cl. 148-131.000.

Kennametal Inc.: *See—*
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Kerr, Ronald Morris. Dewatering of distillery spent wash in the production of by-product dreg meal. 3,747,758, Cl. 210-66.000.

Kershaw, Robert William; and Polgar, Livia, to Dulux Australia Ltd. Liquid compositions comprising gelled urethane polymer. 3,748,294, Cl. 260-22.0tn.

Kessler, Dayton F.: *See—*
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Khattab, Ghazi, to Allied Chemical Corporation. Phosphorus-containing thermoplastic poly(ether-sulfones). 3,748,306, Cl. 260-49.000.

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Kieserling, Th., & Albrecht: *See—*
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Kieves, Raymond, to K-Tel International Inc. Clamp arrangement. 3,747,170, Cl. 24-263.00b.

Kikuchi, Makoto, to Toyoda Koki Kabushiki Kaisha. Rotary dressing apparatus. 3,747,584, Cl. 125-11.0cd.

Kilduff, Herbert, to Leesona Corporation. Severing apparatus for severing ballooning yarn during spinning or twisting. 3,747,314, Cl. 57-34.00r.

Kiley, John S.; and Jason, Robert C., to General Motors Corporation. Rolled adhesives tape having transverse edge slits. 3,747,748, Cl. 206-58.000.

Kilpatrick, Robert G.: *See—*
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Kilsheimer, John R.: *See—*
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Kim, Dong H.: *See—*
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Kim, Kap S.; and Saliga, Thomas V., to Honeywell Information Systems, Inc. Wide frequency range phase shifter device. 3,748,572, Cl. 323-106.000.

Kim, Sang-Chul, to General Electric Company. Photo-flash firing circuit employing parallel resistor-diode combinations. 3,748,084, Cl. 431-95.000.

Kim, Tae Hak. Process for production of tobacco composition and composition made hereby. 3,747,607, Cl. 131-140.00b.

Kimberly-Clark Corporation: *See—*
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King, Richard A., to Litton Systems, Inc. Device for determining the median number in a series of numbers. 3,748,449, Cl. 235-152.000.

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Kitching, Anthony George; and Brown, Mervyn, to Rolls-Royce Limited. Acoustic linings. 3,748,213, Cl. 161-68.000.

Kjellberg, Knut Janne, to AB Volvo Penta. Power boat locking arrangement. 3,747,556, Cl. 115-35.000.

Klaase, Petrus Theodorus Antonius, to Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid. Needle roller for the fibrillation of a splittable plastics. 3,747,817, Cl. 225-97.000.

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Klein, Gerald; and Vieweg, Gunther, to Siemens Aktiengesellschaft. High speed magnetic shaft bearing. 3,747,998, Cl. 308-10.000.

Klementz, Peter; Nitschke, Christoph; and Haubold, Herbert, to Akcona Incorporated. Adjustable thread drawoff apparatus. 3,747,863, Cl. 242-47.080.

Klenk, Ludwig: *See—*
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Knapp, Alfons. Stabilizer device for a jet of water. 3,747,856, Cl. 239-428.500.

Knapp, Heinrich: *See—*
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Knickerbocker, Karl. Newspaper dispensing machine with means to compensate for decreasing supply. 3,747,733, Cl. 194-10.000.

Knothe, Herbert; Buck, Jurgen; Borchard, Heinz; and Rybka, Bruno, to Teldec Telefunken-Decca Schallplatten GmbH. Method for stamping modulated grooves into information carriers. 3,747,390, Cl. 72-376.000.

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Knudson, Robert F., to McGraw-Edison Company. Portable electrostatic air cleaner. 3,747,300, Cl. 55-126.000.

Knupfer, Siegfried; and Brinkmann, Hermann. Liquid applicator device. 3,748,049, Cl. 401-9.000.

Knutson, Dale A., to Applied Power Inc. Flexible cable hydraulic control means. 3,747,472, Cl. 91-384.000.

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Kochinashvili, Alexei Vladimirovich; and Kochinashvili, Tengiz Alexeevich. Device for cutting rolled products. 3,747,456, Cl. 83-404.000.
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Koehly, Gerard, to Commissariat a l'Energie Atomique. Extraction of transplutonium elements from an aqueous solution containing rare earths and fission products. 3,748,104, Cl. 23-342.000.
Koehring Company: *See—*
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Noll, George C., 3,747,957.
Tolbert, William N., Jr., 3,747,642.
Koellisch, Glenn M. Nozzle construction for portable carpet cleaning machine. 3,747,155, Cl. 15-322.000.
Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Energy-responsive luminescent device. 3,748,380, Cl. 178-6.800.
Kohler, George O.: *See—*
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Kok, Albertus Jacobus Theodorus; and Bronnimann, Arnold, to IPP Industrial Polymer Processing S.A. Fluid conduits. 3,747,632, Cl. 137-375.000.
Kolb, Richard G. Method and means for reducing pollutants in exhaust from internal combustion engines. 3,747,581, Cl. 123-141.000.
Koliomichalis, Peter. Inflatable swimming pool cover. 3,747,131, Cl. 4-172.012.
Kollandsrud, Per, to A/S Moelven Brug. Pressure-medium operated percussion or impact apparatus. 3,747,694, Cl. 173-137.000.
Koller, Walter. Card index with selecting means. 3,747,244, Cl. 40-65.000.
Komine, Yoshio: *See—*
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Kondo, Takao; Fushimi, Shinji; and Kawabe, Kunitsugu, to Nissan Motor Company, Limited. Method for forming a soft nitride layer in a metal surface. 3,748,195, Cl. 148-16.500.
Koorneef, Jacob: *See—*
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Kornylak, Andrew T., to Kornylak Corporation. Low profile conveyor roller. 3,747,736, Cl. 198-25.000.
Kornylak Corporation: *See—*
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Kozacka, Frederick J.; and Jacobs, Philip C., Jr., to Chase-Shawmut Company, The. Electric fuse with fusible element in form of a wire. 3,748,622, Cl. 337-276.000.
Kozel, Charles: *See—*
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Kozub, Stanley S . Golf cart having shoe cleaning brush attached to wheel. 3,747,150, Cl. 15-105.000.
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Krapcho, John, to Squibb, E. R., & Sons, Inc. N-aminoalkyl-benzalkylenimine carboxamides. 3,748,321, Cl. 260-239.0bb.
Kravets, Arkady Timofeevich: *See—*
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Krayl, Gerhard Max, to Aesculap Werke Aktiengesellschaft vormals Jetter & Scheerer. Cutterhead unit for hair clipper. 3,747,212, Cl. 30-221.000.
Krellmann, Herbert: *See—*
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Kroll, Heinz E., to International Standard Electric Corporation. Method of producing terminal pins of a printed circuit board. 3,747,210, Cl. 29-630.00r.
Kroll, Stanley; and Platzman, Michael M. Wheel sensing apparatus. 3,748,443, Cl. 235-92.0tc.
Kronseder, Herrmann: *See—*
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Krook, Otto Erik; and Nordblad, Sven Sigurd, to Telefonaktiebolaget L M Ericsson. Insulated cable with wire for slitting a protective sheath. 3,748,371, Cl. 174-70.00r.
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Kuhar, George A.; Miller, Wallace R.; and Finelli, Anthony F., to Goodyear Tire & Rubber Company, The. Process for making a friction element and polymeric composition. 3,748,301, Cl. 260-41.00a.
Kuhn, Falk; Fink, Josef; Maier, Gunter; and Kohler, Pius, to Fouquet-Werk Frauz & Planck. Apparatus for placing of control pins, or breaking off of control butts of control elements in jacquard selectors for textile machinery. 3,747,191, Cl. 29-208.00c.
Kuhn, Rudolf, to Deutsche Babcock & Wilcox Aktiengesellschaft. Predrying tunnels for mill drying devices. 3,747,571, Cl. 122-235.00r.
Kuhn, Udo, to Kalle Aktiengesellschaft. Contact copying apparatus. 3,748,039, Cl. 355-106.000.
Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, to Farwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process and agents having an influence on the weather. 3,748,278, Cl. 252-319.000.
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Kume, Shinji: *See—*
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Kummel, Fritz; and Hennecke, Rudolf, to Delmag-Maschinefabrik Reinhold Dornfeld. Diesel pile driver for impact atomization. 3,747,693, Cl. 173-128.000.
Kurtz, Anthony D., to Kulite Semiconductors Products, Inc. Pressure sensitive transducers employing capactive and resistive variations. 3,748,571, Cl. 323-74.000.
Kurz, John C., to Advanced Air, Inc. Horizontal fire damper. 3,747,662, Cl. 160-1.000.
Kuumoto, Mashahiko: *See—*
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Kyle, Thomas A.; and Schutrum, Walter L., to National Cash Register Company, The. Microform viewer indexing means. 3,748,032, Cl. 353-27.000.
Kyodo Insatsu Kabushiki Kaisha: *See—*
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Lacey, Robert Ronald, to Universal Oil Products Company. Seats. 3,747,976, Cl. 297-361.000.

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Ladine, Lyal E. Apparatus for sequentially displaying data. 3,747,245, Cl. 40-72.000.

LaForce, Jean: *See—*
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Laing, Nikolaus. Freezing chamber with refrigeration storage. 3,747,364, Cl. 62-430.000.

Laing, Nikulaus. Spherical bearings. 3,748,000, Cl. 308-9.000.

L'Air Liquide, Societe Anonyme pour l'Etude et Exploitation des Procedes Georges Claude: *See—*
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Lalancette, Jean-Marc, to Universite de Sherbrooke. Polyhydroxy silicate-polymer reaction product. 3,748,300, Cl. 260-38.000.

Lame, Stephen J.; and Holce, Thomas J. Percussive musical instrument with transducer for actuating an electronic tone generator. 3,748,367, Cl. 84-1.040.

Lamson & Sessions Co.: *See—*
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Lang, Karl, to Siemens Aktiengesellschaft. Electric machine of large diameter and low rotational speed having a liquid-cooled rotor. 3,748,506, Cl. 310-53.000.

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Lapper, Maurice Noel, to British Steel Corporation. Apparatus for testing magnetic characteristics of a moving metal utilizing a roller containing a fixed nonrotatable monitor in contact with the strip. 3,748,575, Cl. 324-34.00r.

Larsen, Olaf E.: *See—*
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Larson, Olaf A.; and Vayda, Adam V., to Gulf Research & Development Company. Hydrocracking catalyst and process. 3,748,257, Cl. 208-111.000.

Larson, Robert J.; and Stevens, Charles W., Jr., to C.W.S. Industries, Inc. Sonar transducer assembly. 3,748,637, Cl. 340-8.000.

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Latinen, George A.; deceased (by Latinen, May V.; administratrix); and Carter, Leo F., to Monsanto Company. Mixer. 3,747,899, Cl. 259-9.000.

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Lawlor Industries, Inc.: *See—*
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Lay, Willard E. Propelling and steering means for boats. 3,747,555, Cl. 115-18.000.

Layer, Gerard E.; Yates, John S.; and Kreuzer, John A., to Susquehanna Corporation, The. Tow cable assembly. 3,747,873, Cl. 244-3.000.

Lazennec, Yvon: *See—*
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Lear Siegler, Inc., mesne: *See—*
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Lee, Hanju; and Rosen, Harvey Milton, to Grace, W. R., & Co. Closed-loop generating and contacting system. 3,748,262, Cl. 210-63.000.

Lee, Kung Hsing, to Du Pont de Nemours, E. I., and Company. Process for preparing microporous cellular polymeric structures. 3,748,287, Cl. 260-2.5ay.

Lee, Kyu Tai, to Du Pont de Nemours, E. I., and Company. 4-Aza-5-carbamoyloximido-tricyclo[4.2.1.1^{2,5}] undecanes. 3,748,322, Cl. 260-239.0bf.

Lee, Sung Ki, to Hooker Chemical Corporation. Conductive designs and process for their manufacture. 3,748,109, Cl. 29-195.000.

Leeb, Alfons: *See—*
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Leech, George W.: *See—*
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Lehovec, Kurt. Arrays of electro-optical elements and associated electric circuitry. 3,748,479, Cl. 250-208.000.

Leingang, Charles J., to Lord Corporation. Trunnion mounting. 3,747,878, Cl. 248-9.000.

Leis, Daniel. Portable stand structure. 3,747,882, Cl. 248-96.000.

Lemkin, Jack Lewis: *See—*
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Lenzi, Anthony J., to Schlegel Manufacturing Company, The. Hollow tubular windlace. 3,748,215, Cl. 161-139.000.

Lepor, Meyer, to United States of America, Navy. Method for applying an acoustic barrier. 3,748,167, Cl. 117-72.000.

Lerner, Martin L., to Zenith Radio Corporation. Method and apparatus for detecting halogen group gas. 3,748,097, Cl. 23-232.00e.

Leroi, Jean-Claude: *See—*
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Levin, Martin E., to Varian Associates. High frequency beam tube having an R.F. shielded and insulated collector. 3,748,513, Cl. 313-30.000.

Levit, Edward C.; and Van Gessel, Robert C., to Steelcase Inc. Clip. 3,748,006, Cl. 312-111.000.

Leviton Manufacturing Co., Inc.: *See—*
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Lewis, Daniel W., to Westinghouse Electric Corporation. Fluorescent lamp having titania-doped glass envelope with transparent buffer film of titania. 3,748,518, Cl. 313-109.000.

Lewis, Karl D.; Hasselwander, Ray W.; and Amann, William Leon. Agitator for facilitating flow from hopper. 3,747,811, Cl. 222-233.000.

Leybold-Heraeus——Verwaltung G.m.b.H.: *See—*
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Libby, Charles C.: *See—*
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Licentia Patent-Verwaltungs G.m.b.H.: *See—*
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Lieberman, Abraham Buddy. Bag dispensing unit and the method of opening and removing the bags therefrom. 3,747,298, Cl. 53-390.000.

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Liebsch, Dietrich; Meisert, Ernst; and Stopp, Gerhard, to Bayer Aktiengesellschaft. Compounds containing the 2,4,6-triketo-1,3,5-oxadiazine ring. 3,748,329, Cl. 260-244.00r.

Likhtman, Alexandr Efimovich; Pyatyshev, Vavil Ivanovich; and Zagorodnikov, Valentin Romanovich. Device for producing spherical charges from metals and alloys. 3,748,071, Cl. 425-6.000.

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Lin, Kou Chi; and Dobson, Le Roy E., to Westinghouse Electric Corporation. Electrical bushing assembly. 3,748,368, Cl. 174-12.0bh.

Linares, Hubert, to Rhone-Poulenc S.A. Copper salts of bis(arylenotriazole)diphenyldicarboxylic acid useful as heat stabilizers for polyamides. 3,748,337, Cl. 260-299.000.

Lind, Roger S., to Tektronix, Inc. Method of sealing ceramic to nonmetallic using indium alloy seal. 3,747,173, Cl. 29-25.130.

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Linden, Gosta R., to North American Rockwell Corporation. Signature stitcher interrupter apparatus. 3,747,824, Cl. 227-3.000.

Linder, Marshall, to AT & M Corporation. Sectional easyup planter. 3,747,268, Cl. 47-34.000.

Lindquist, Arwin B.: *See—*
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Linkus, Joseph A., to Warner & Swasey Company, The. Unloader assembly. 3,747,920, Cl. 271-85.000.

Lippincott, Samuel B.: *See—*
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Taburinsky, Grigory Semenovich; Kholodenko, Petr Iosifovich; Lisitsyn, Konstantin Mikhailovich; Kinyaev, Boris Alexeevich; Krichevsky, Lev Abramovich; Novozhilov, Nikolai Fedorovich; Sverdlik, Naum Borisovich; and Poplavsky, Vladislav Iosifovich, 3,747,665
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Lkdahl, Wendell Graydon, to Johns-Manville Corporation. Method of recovering oil from a water surface. 3,747,760, Cl. 210-84.000.
Lloyd, Hershall E. Earthquake sensitive shut-off valve. 3,747,616, Cl. 137-38.000.
Lochridge, Joe C.; and Gibson, Tony Leon, to Brown & Root, Inc. Method of arresting the propagation of a buckle in pipeline. 3,747,356, Cl. 61-72.300.
Loeffler, Larry J., to Merck & Co., Inc. Spiro (3.3) heptane amino acids. 3,748,354, Cl. 260-514.00g.
Loffler, Manfred: *See—*
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Lommel, James M.: *See—*
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Long, Olan L., to Westinghouse Electric Corporation. Fluid coupling with sink retainer. 3,747,893, Cl. 251-148.000.
Long, William C. Elementary circular slide rule. 3,747,846, Cl. 235-84.000.
Long, William T. Wrecker sling pin lock. 3,747,783, Cl. 214-86.00a.
Lonza Ltd. A.G.: *See—*
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Lorenz, Horst; and Weck, Karl Gustav, to Kieserling, Th., & Albrecht. Drive mechanism for the clamping carriages of peeling machines. 3,747,822, Cl. 226-162.000.
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Louis, George A.: *See—*
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Lovell, Patrick A. Mine ventilation control system. 3,747,503, Cl. 98-50.000.
Lovendahl, Norman H. Tool holder arrangement. 3,747,179, Cl. 29-96.000.
Lovendusky, Charles Michael, to AMP Incorporated. Card reader transport device. 3,748,442, Cl. 235-61.11d.
Lovitz, David D., to Sternco Industries, Inc. Turtle tank. 3,747,566, Cl. 119-5.000.
Lovness, Donald E., to Ringer, Judd, Corporation. Insect killer. 3,747,260, Cl. 43-131.000.
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Lucas, Joseph, (Industries) Limited: *See—*
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Luebbe, Ray H., Jr., to Xerox Corporation. Manifold imaging machine. 3,748,034, Cl. 355-3.000.
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May, Robert E.; and Triplett, Benny L., to Burlington Industries, Inc. Lined textile fabric and method of manufacture. 3,748,217, Cl. 161-159.000.
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Mizuno, Tsugio, to Kabushiki Kaisha Koishikawa Shokai. Musical instrument with bells. 3,747,462, Cl. 84-406.000.

Mizutani, Norio; Sasaki, Ichiro; Ito, Takamitsu; Ueno, Hiroshi; Nishizaki, Shoichi; and Ishizuka, Tetsuo, to Dai-Ichi Koghy Seiyaku Co., Ltd. Method for the purification of sucrose esters of fatty acids. 3,748,324, Cl. 260-234.00r.

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Molina, Orlando G., to North American Rockwell Corporation. Nonaqueous developer composition for penetrant inspection and method for employing same. 3,748,469, Cl. 250-459.000.

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Molnar, Steven I. Pump with basically reduced pumper force. 3,748,064, Cl. 417-400.000.

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Montiague, Josef. Convertible sofa. 3,747,134, Cl. 5-8.000.

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Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Refractory laminate based on negative sols or silicates and basic aluminum salts. 3,748,157, Cl. 106-38.350.

Moore, Harold R., to Westinghouse Electric Corporation. Method of constructing a continuously transposed transformer coil. 3,747,205, Cl. 29-605.000.

Moore, Robert R., to United States of America, Atomic Energy Commission. Gauging system. 3,747,219, Cl. 33-174.00l.

Moorman, Charles J.; and Goldman, Myron D., to Mosler Safe Company, The. Vertically reciprocating door and actuating mechanism therefor. 3,747,274, Cl. 49-280.000.

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Morin, Gerard, to Societe Anonyme DBA. Extensible universal joint. 3,747,369, Cl. 64-21.000.

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Ohki, Haruo, 50% to Ito, Yoshie. Manually actuated and electrically operated rotatable drum chance devices and savings bank. 3,747,936, Cl. 273-143.00r.

Ohmart Corporation, The: *See—*
Chen, You Min, 3,748,473.

Ohno, Masaji. Device for measuring an amount of powdered milk and dissolving the same. 3,747,414, Cl. 73-428.000.

Ohsawa, Mitsuo, to Sony Corporation. Control signal generating circuit for sharp frequency response tuning. 3,748,582, Cl. 325-344.000.

Okada, Takashi: *See—*
Makino, Hiroshi; Nakamura, Susumu; Okada, Takashi; and Matsumi, Koichi, 3,748,271.

Okano, Yoshimitsu, to Nippon Electric Company, Limited. Data signal transmission system employing phase modulation. 3,748,385, Cl. 178-67.000.

Olechowski, Jerome Robert, to Cities Service Company. Alkylation of polystyrene. 3,748,318, Cl. 260-93.50a.

Oleinik, Ivan Pavlovich: *See—*
Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich, 3,747,149.

Olgard, Gunnar; and Jernqvist, Ake. Arrangement for separation of suspended or emulsified material from a liquid. 3,747,759, Cl. 210-73.000.

Olinkraft, Inc.: *See—*
Graser, Earl J., 3,747,801.
Graser, Earl J., 3,747,835.

Olivera, Virgilio Andres. Nasal filter. 3,747,597, Cl. 128-140.00n.

Olivetti, Ing., C., & C. S.p.A.: *See—*
Pomella, Piero; and Lauro, Luciano, 3,748,563.

Olivier, Jeanne Denise: *See—*
Bouiller, Jean Georges; Lacroix, Armand Jean-Baptiste; and Bauger, Louis Jules, 3,748,058.

Olsen, Peter A. Adjustable weight bobber. 3,747,257, Cl. 43-43.140.

Olsen, Roger F.: *See—*
Waner, Donald W.; and Olsen, Roger F., 3,747,428.

O'Neil, Robert A., to Geerpres Wringer, Inc. Wringer bucket. 3,747,154, Cl. 15-264.000.

O'Neill, Charles J., to Conco Inc. Sewer cleaning machine. 3,747,153, Cl. 15-104.3sn.

O'Neill, Michael J., to Perkin-Elmer Corporation, The. Linearizing circuit for a ramp generator in a differential scanning calorimeter. 3,747,396, Cl. 73-15.00b.

Ono, Tasuku, to Suchiron Kagaku Kogyo Kabushiki Kaisha and Daishin Trading Co., Ltd. Sounding device. 3,747,266, Cl. 46-232.000.

Onoda, Michio; Usui, Saburo; Simizume, Tutomu; and Taguchi, Mitsuru, to Nissan Motor Company, Limited. Temperature control system for catalytic converter. 3,747,346, Cl. 60-286.000.

Opferman, David Clement: *See—*
Mc Fowen, James Royce; Opferman, David Clement; and Smith, Robert McKee, 3,748,649.

Optical Coating Laboratories, Inc.: *See—*
Eufusia, Eugene A., 3,747,634.

Orans, Alfred A. Kaleidoscope. 3,748,013, Cl. 350-5.000.

O'Reilly, Donald E.; and Salamony, James E., to United States of America, Atomic Energy Commission. Method for dispersing Cr^{3+} ions impregnated in silica. 3,748,283, Cl. 252-455.00r.

Orenstein & Koppel Aktiengesellschaft: *See—*
Bangert, Hans; and Arenz, Werner, 3,747,651.

Orr, William R.: *See—*
Montgomery, William C., Jr.; and Orr, William R., 3,748,638.

Osepchuk, John M., to Raytheon Company. Image correlator tube with crossed field deflection. 3,748,524, Cl. 315-11.000.

Ossendorf, Drich: *See—*
Meier, Franz; Ossendorf, Drich; and Wolfgarten, Hubert, 3,747,309.

Ostrager, Seymour A. Spirit vial assembly with improved vial aligning means. 3,747,221, Cl. 33-371.000.

Oswitch, Stanley; and Golownia, Robert F., to Ferro Corporation. Non-burning, low smoke, low toxic gas-producing thermo-setting pre-preg compositions. 3,748,317, Cl. 260-37.00r.

Otis Engineering Corporation: *See—*
Taylor, Frank H., 3,747,682.

Otto, Dr. C., & Comp. GmbH: *See—*
Pries, Erich, 3,748,235.

Otto, Franz: *See—*
Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 3,748,503.

Ouellette, Herve J., to United States of America, Army. Feeding system for automatic firearms with a rotary drum. 3,747,249, Cl. 42-50.000.

Outboard Marine Corporation: *See—*
Densow, Ulrich O.; and Simmons, Lloyd A., 3,747,649.
Henrich, Donald A., 3,748,061.

Overstreet, Charles L.: *See—*
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Fritzsche, Hellmut; Ovshinsky, Stanford R.; Shaw, Robert F.; Silver, Marvin; and Smejtek, Pavel, 3,748,501.

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Neumann, John W.; Clark, Chester G.; and Minbiole, Louis J., Jr., 3,748,177.

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Nykopp, Erik Albert; and Utriainen, Leino Yrjo, 3,747,181.
Ruohola, Tuomo; Nyberg, Pauli Unto Juhani; Joutsen, Ero Oskari; and Ennelin, Kullervo, 3,747,542.

Pacific Roller Die Co., Inc.: *See—*
Davis, Paul K., 3,747,446.

Paddle Pumps Incorporated: *See—*
Sully, Frank H.; and Simer, Loren J., 3,748,066.

Paget, Arthur Averil, to Scriven & Paget Limited. Spindle driving mechanism. 3,747,315, Cl. 57-74.40s.

Paine, David L.: *See—*
Wenger, Jerry A.; Paine, David L.; and Dorschner, Irvin E., 3,747,708.

Paine, David L.; and Urch, Harvey M., to Wenger Corporation. Portable folding riser. 3,747,706, Cl. 182-113.000.

Palm, Lewis J.; and Palm, Ronald B., to Fulton Boiler Works, Inc. Thermal fluid heater. 3,747,670, Cl. 165-1.000.

Palm, Ronald B.: *See—*
Palm, Lewis J.; and Palm, Ronald B., 3,747,670.

Palmer, Donald R. Method and apparatus for edit marking teleprinter tape and making final print therefrom. 3,748,387, Cl. 178-112.000.

Palyi, Leslie. Device for humidifying corn. 3,747,511, Cl. 99-516.000.

Pantaleoni, Nancy N.: *See—*
Nutter, Dale E., 3,747,905.

Papanastastou, Theodore A.: *See—*

Carcia, Leslie C.; Mc Neill, John D.; Papanastastou, Theodore A.; Howers, Norman K.; and Tjonpiangi, William E., 3,748,650.

Parker, Kenneth Frederick. Board game apparatus. 3,747,933, Cl. 273-131.00b.

Parker, Norman W., to Motorola, Inc. Recording system for color video signals. 3,748,376, Cl. 178-5.4cd.

Parker-Hannifin Corporation: *See—*
Brown, Carl, 3,747,772.

Parrill, Victor: *See—*
Gigantino, Otto M.; Parrill, Victor; and Gigantino, Leonard D., 3,747,892.

Parrott, Bell, Seltzer, Park & Gibson: *See—*
Davidson, Richard L., 3,747,692.

Pasha, Leonid Georgievich: *See—*
Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich, 3,747,149.

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Paulk, Jacob W.: *See—*
Paulk, John R.; and Paulk, Jacob W., 3,747,267.

Paulk, John R.; and Paulk, Jacob W. Crop tying machine. 3,747,267, Cl. 47-1.000.

Pauwells, Edward M., to Bendix Corporation, The. Compact adaptive braking system. 3,747,705, Cl. 188-181.00a.

Payne, Bobby R.: *See—*
Wenneborg, William Z.; Payne, Bobby R.; and Bunnelle, Philip R., 3,747,696.

Peabody Engineering Corporation: *See—*
Arnold, Orlan M.; and Vancini, Carlo A., 3,747,906.
Dunn, John, 3,748,080.

Pearson, Whitney Lombard; Banford, John Alexander; and Szymanski, Earl Thaddeus, to Abbott Laboratories. Apparatus for making implant capsules. 3,748,209, Cl. 156-510.000.

Pearson, Willard C.: *See—*
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.

Pease, James F. Method of making a heating element and fitting assembly. 3,747,206, Cl. 29-611.000.

Pedrazzoli, Andrea; and Astay, Leone Dall, to Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicoles-E.R.S.M.E. Adamantane derivatives. 3,748,346, Cl. 260-348.00r.

Peeling, John E., Jr., to SCM Corporation. Process for generating vesicular material having porous, sorptive surface structure with metallurgical silicon addition. 3,748,171, Cl. 117-129.000.

Pekar, Allen L.: *See—*
Sayles, John H.; and Pekar, Allen L., 3,748,448.

Pelezo, Chris A.: *See—*
Dobinson, Frank; and Pelezo, Chris A., 3,748,298.

Pellowski, Daniel W. Animal trap and trap holder. 3,747,259, Cl. 43-90.000.

Pendleton Tool Industries, Inc.: *See—*
Kneier, Joseph W.; and Perkins, George D., 3,747,796.

Penick, Ib, to Simpro Corporation. Camera shutter and flashlamp igniting system. 3,747,492, Cl. 95-11.50r.

Pennstar Company, The: *See—*
Pilish, Andre, 3,747,292.

Pennsylvania Engineering Corporation: *See—*
Anderson, Charles H., 3,747,908.

Pennwalt Corporation: *See—*
Richman, Jay Lewis, 3,747,808.

Pepino, George T.; and Priceman, Seymour, to De Wiant Corporation, mesne. Method of making electric heating elements. 3,747,207, Cl. 29-611.000.

Pepper, Kenneth V., to Genova Products. Stop valve. 3,747,894, Cl. 251-215.000.

Perello, Armando: *See—*
Gray, Samuel A.; and Perello, Armando, 3,748,656.

Perigo, Leon A.; and Jordan, John A., to Coors Procelain Company. Wear resistant assembly. 3,747,291, Cl. 52-127.000.

Perkin-Elmer Corporation, The: *See—*
Offner, Abe, 3,748,015.
O'Neill, Michael J., 3,747,396.
Rigden, Jameson Dane, 3,748,595.

Perkins, George D.: *See—*
Kneier, Joseph W.; and Perkins, George D., 3,747,796.

Perret, Jean Charles, to Compagnie Francaise d'Etuded et de Construction Technip. Cooling and low temperature liquefaction of gaseous mixtures with multicomponent refrigerant. 3,747,360, Cl. 62-40.000.

Persson, Jan Edvard, to Atlas Copco Aktiebolag. Toothed rotor piston machine. 3,748,069, Cl. 418-191.000.

Pertics, Emil Elias. Device for stemming fruit. 3,747,515, Cl. 99-640.000.

Peshina, William F.: *See—*
Peshina, William J.; Peshina, William F.; and Stevers, Roger F., 3,747,307.

Peshina, William J.; Peshina, William F.; and Stevers, Roger F., to Royal Wire Products, Inc. Telescopic support for bag filters. 3,747,307, Cl. 55-379.000.

Pesz, Robert G.; and Cleary, Robert T., to GTE Automatic Electric Laboratories Incorporated. Ring trip circuit. 3,748,401, Cl. 179-84.00r.

Peters, Alexander A., to Eastman Kodak Company. Film advance and metering mechanism for cameras. 3,747,494, Cl. 95-31.0ac.

Petersen, Oscar J., to Robertshaw Controls Company. High temperature and pressure capacitance probe. 3,748,551, Cl. 317-246.000.

Peterson, Robert A., to Raytheon Company. Microwave melter apparatus. 3,748,421, Cl. 219-10.550.

Peterson, Wayne L.; Blinne, David L.; and Sanderson, Robert W., III, to International Harvester Company. Self positioning seat. 3,747,723, Cl. 180-77.00s.

Petetin, Paul Arsene Jean Gabriel. Method and means for constructing and transporting prefabricated houses. 3,747,788, Cl. 214-512.000.

Pfammatter, Theodul: *See—*
Stocker, August; Marti, Othmar; and Pfammatter, Theodul, 3,748,336.

Pfeiffer, Arthur, Vakuumtechnik GmbH: *See—*
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Pfizer Inc.: *See—*
Hamanaka, Ernest S., 3,748,323.

Phelps, Harold E., to Phelps, Harold E., Inc. Fuel supply system. 3,747,903, Cl. 261-27.000.

Phelps, Harold E., Inc.: *See—*
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Philco-Ford Corporation: *See—*
Stahlhuth, Paul H., 3,747,434.
Swaney, C. William, Jr., 3,747,199.
Wedam, Werner F., 3,748,526.

Philipps, Samuel D. Apparatus for transfer of particulate material in glass melters. 3,748,112, Cl. 65-335.000.

Phillips, John J.; Posakony, Gerald J.; and Stephenson, Roger C., to G & H Technology, Inc. Aircraft submergence detector. 3,748,635, Cl. 340-1.001.

Phillips Petroleum Company: *See—*
Forseth, Glenn J., 3,748,100.
Williams, George E.; and Larsen, Olaf E., 3,748,077.

Piampiano, Carl P.; and Piampiano, Corra J. Fabrication of composite fur pelt. 3,748,212, Cl. 161-36.000.

Piampiano, Corra J.: *See—*
Piampiano, Carl P.; and Piampiano, Corra J., 3,748,212.

Picard, Jean: *See—*
Seals, William O.; and Picard, Jean, 3,748,161.

Pickands Mather & Co.: *See—*
McDermott, William Francis; Plaistow, Joseph James; and Hirvela, Veikko Adolph, 3,747,411.

Pickard, John E.: *See—*
Weber, Charles H., III; and Pickard, John E., 3,748,190.

Pickens, Paul D. Oscillating cylinder internal combustion engine. 3,747,578, Cl. 123-42.000.

Pickering, Alan Hugh, to English Electric Valve Company Limited. Magnetron oscillators. 3,748,592, Cl. 331-90.000.

Pilarczyk, Karol, to Carrier Corporation, mesne. Compressor base and intercoolers. 3,748,065, Cl. 417-423.000.

Pilish, Andre, to Pennstar Company, The. Weather seal for pre-cast structural panels. 3,747,292, Cl. 52-396.000.

Pincura, Peter P., Jr.; and Sanchez, Luis T., to United States Steel Corporation. Screed for cleaning nose of tilting vessel. 3,747,910, Cl. 144-1.00s.

Pioneer Electronic Corporation: *See—*
Iwasaki, Tadahisa, 3,747,939.

Piotrowski, Charles; and Waite, Paul T. Expansible work holder. 3,747,445, Cl. 82-44.000.

Pipkins, David D., to Valspar Corporation, The. Method of printing with carbonated ink. 3,747,523, Cl. 101-170.000.

Pitney Bowes-Alpex, Inc.: *See—*
Yudewitz, Norman, 3,747,321.

Pittet, Alan O.; Mason, Michael E.; Theimer, Ernst T.; and Tibbetts, Merrick S., to International Flavors & Fragrances Inc. Bicyclic pyrazine compositions for flavoring processes. 3,748,145, Cl. 99-140.00r.

Plaistow, Joseph James: *See—*
McDermott, William Francis; Plaistow, Joseph James; and Hirvela, Veikko Adolph, 3,747,411.

Plasmachem, Inc.: *See—*
Davis, Robert D.; Meyer, Theodore N.; and Blizzard, Roy L., 3,748,106.

Plasser, Franz, Bahnbaumaschienen-Industrie-Gesellschaft m.b.H.: *See—*
Theurer, Josef, 3,747,536.

Plastic Tubing, Inc.: *See—*
Maroschak, Ernest J., 3,747,352.

Plattner, Pierre, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Electromagnetic generator for a rifled projectile. 3,747,529, Cl. 102-70.2ga.

Platzman, Michael M.: *See—*
Kroll, Stanley; and Platzman, Michael M., 3,748,443.

Plessey, Incorporated: *See—*
Noren, Saul, 3,748,544.

Pluck, Mervyn M., to General Electric Company. Horizontal driver circuit for television receiver. 3,748,527, Cl. 315-26.000.

Poepsel, James R.; and Weber, Paul S. Furnace silencers. 3,748,085, Cl. 431-114.000.

Polaroid Corporation: *See—*
Avtges, James A.; Reid, Jerome L.; Schlein, Herbert N.; and Taylor, Lloyd D., 3,748,129.
Bennett, Stewart, 3,747,488.
Brandt, Edison R.; and Costa, Peter F., 3,747,489.
Brandt, Edison R., 3,747,490.
Downey, Rogers B., 3,747,813.
Hoffman, Arnold; and Zuckerman, Bernard, 3,748,130.

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Pols, Albert C.: *See—*
Feenstra, Robijn; and Pols, Albert C., 3,747,699.

Pomagalski S. A.: *See—*
Tauzin, Francis, 3,747,974.

Pomella, Piero; and Lauro, Luciano, to Olivetti, Ing., C., & C. S.p.A. Numerical control devices for machine tools to permit continuous motion between segments of the desired path. 3,748,563, Cl. 318-573.000.

Poplavsky, Vladislav Iosifovich: *See—*
Taburinsky, Grigory Semenovich; Kholodenko, Petr Iosifovich; Lisitsyn, Konstantin Mikhailovich; Kinyaev, Boris Alexeevich; Krichevsky, Lev Abramovich; Novozhilov, Nikolai Fedorovich; Sverdlik, Naum Borisovich; and Poplavsky, Vladislav Iosifovich, 3,747,665

Poppitz, Harold A. Cleaner assembly. 3,748,050, Cl. 401-289.000.

Porrmann, Herbert; Klenk, Ludwig; and Loffler, Manfred, to Kalle Aktiengesellschaft. Process and apparatus for the continuously densifying nonwoven webs. 3,747,174, Cl. 26-18.500.

Porter, Russell W.; and Riley, John C., to General Electric Company. Variable nozzle area control system. 3,747,344, Cl. 60-242.000.

Portuesi, Eugene G.: *See—*
Portuesi, Salvador F., 3,747,845.

Portuesi, Salvador F., 1/2 to Portuesi, Eugene G. Speed and distance computer for bicycles. 3,747,845, Cl. 235-78.000.

Posakony, Gerald J.: *See—*
Phillips, John J.; Posakony, Gerald J.; and Stephenson, Roger C., 3,748,635.

Post, Daniel. Lever-type ski boots. 3,747,235, Cl. 36-2.5al.

Potter, Harold F., to Carlton Company. Heat treating apparatus. 3,748,425, Cl. 219-10.690.

Pottharst, John E., Jr. Liquid distillation unit with polygonal downcomer. 3,748,234, Cl. 202-187.000.

Poullain, Michel Georges: *See—*
Ribour, Jean Louis; and Poullain, Michel Georges, 3,748,584.

Powell, Robert M., to United States of America, Navy. Overriding impact proximity fuze. 3,747,531, Cl. 102-70.20p.

Power Conversion, Inc.: *See—*
Rosansky, Martin G.; and Jagid, Bruce E., 3,748,186.

PPG Industries, Inc.: *See—*
Hummell, John D., 3,748,081.

Pravaz, Marcel H., to Etudes et Fabrications Aeronautiques. Rapid release buckle for safety belts and harness. 3,747,167, Cl. 24-205.170.

Precin, Raymond J.: *See—*
Johnson, Delmar R.; and Precin, Raymond J., 3,747,872.

Precision Industries, Inc., mesne: *See—*
Barland, Lauri C., 3,747,823.
Barland, Lauri C., 3,747,825.
Little, Stanley, 3,747,826.
Stanton, Stephen; Varholy, Edward; and Verwey, William, 3,747,827.

Prescott, Basil O.: *See—*
Fort, Eldon R.; Prescott, Basil O.; and Walters, Arley, 3,747,405.

Price, Edison A. Recessed suspended lighting fixture. 3,748,460, Cl. 240-51.11r.

Price, Edison A. Electrical fixture coupling and support apparatus. 3,748,629, Cl. 339-21.00r.

Price, H. C., Co.: *See—*
Harris, Robert J.; and Sikes, Gail T., 3,747,192.

Price, Ralph E., to Landes Tool Company. Mechanism for precision locating of a crankshaft in an automatic crankpin grinding machine. 3,747,283, Cl. 51-237.0cs.

Priceman, Seymour: *See—*
Pepino, George T.; and Priceman, Seymour, 3,747,207.

Pries, Erich, to Otto, Dr. C., & Comp. GmbH. Pollution free discharging and quenching system. 3,748,235, Cl. 202-227.000.

Prieur, Lucien Robert; and Rousseau, Hubert Cecyl Albert, to Societe Industrielle Honeywell Bull (Societe anonyme). Magnetic head positioning mechanism with longitudinal rod and cam. 3,748,407, Cl. 179.100.2ca.

Procter & Gamble Company, The: *See—*
Zoepf, Alfred W.; and Hood, Charles R., 3,747,803.

Productive Instruments & Machine, Inc.: *See—*
Skipper, Claud T., 3,747,911.

Prolizenz AG: *See—*
Gyongyos, Ivan; and Barzettes, Les, 3,747,666.

Provalor A.G.: *See—*
Ackeret, Peter, 3,747,838.

Provenzano, Joseph C.; and Govednik, Richard E., to GTE Automatic Electric Laboratories Incorporated. Apparatus with labyrinth heat exchanger for the sputtering deposition of thin films. 3,748,253, Cl. 204-298.000.

Pryor, James T., to Nuperm, Inc., mesne. Storage cabinet. 3,748,008, Cl. 312-184.000.

Pugh, Charles D., to Burlington Industries, Inc. Control mechanism for producing random-like effects on textile materials. 3,748,648, Cl. 340-172.500.

Pugh, Evan R., to Avco Corporation. Radio frequency electrically excited flowing gas laser. 3,748,594, Cl. 331-94.500.

Pullen, Eric V.: *See—*
Manoogian, Alex; and Pullen, Eric V., 3,747,638.

Punderson, John Oliver: *See—*
McMahon, Eugene Joseph; Punderson, John Oliver; and Vitcusky, William Paul, 3,748,372.

Purdy, Haydn Victor; and McIntosh, Ronald Campbell, to Harris, Purdy & McIntosh Limited. Phototypesetters. 3,747,484, Cl. 95-4.50r.

Pustovarin, Ivan Yakovlevich: *See—*
Astapovich, Artem Ivanovich; Bogoljubov, Sergei Alexandrovich; Kuznetsov, Nikolai Ivanovich; Lupanov, Oleg Dmitrievich; Pustovarin, Ivan Yakovlevich; and Fedorova, Tamara Alexeevna, 3,747,183.

Putman, Richard E. J.: *See—*
Tillie, W. Robertus J.; Carleton, James T.; and Putman, Richard E. J., 3,748,224.

Putnam, Richard C., to Cessna Aircraft Company, The. Pressure loaded gear pump. 3,748,063, Cl. 418-132.000.

Putscher, Johann: *See—*
Becker, Erwin; and Putscher, Johann, 3,747,491.

Pyatyshev, Vavil Ivanovich: *See—*
Likhtman, Alexandr Efimovich; Pyatyshev, Vavil Ivanovich; and Zagorodnikov, Valentin Romanovich, 3,748,071.

Pyramid Derrick & Equipment Corporation: *See—*
Branham, Donald R.; and Borg, Paul E., 3,747,402.

Pyramid Derrick and Equipment Corporation: *See—*
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Pyrnnics, Inc.: *See—*
Shular, Howard Edward, 3,748,087.

Q-TV, Inc.: *See—*
Eisenberg, Alvin S., 3,748,384.

Quaker Oats Company, The: *See—*
Fabricant, Norman, 3,747,937.

Raaf, Helmut; and Buttel, Kurt, to MEPAG Metall and Plastik Packung GmbH & Company. Device and method for simultaneously dispensing different materials from a container. 3,747,804, Cl. 222-1.000.

Raasch, Hans, to Schlafhorst & Co. Method and device for monitoring the readying of spinning cops for unwinding the same. 3,747,862, Cl. 242-35.60r.

Rader, James R.; and Smith, Paul W. Teaching aid for demonstrating drug circulation or the like in human body. 3,748,366, Cl. 35-17.000.

Radin, Bernard G.; and Vanderberg, Lawrence J., to Ford Motor Company. External high speed warning system for an automotive vehicle. 3,748,642, Cl. 340-62.000.

Rainey, Harold N.: *See—*
Glover, Boyd W.; and Rainey, Harold N., 3,747,301.

Ralph, Harold J. Absorbent liner and holder portion of a sanitary garment. 3,747,602, Cl. 128-287.000.

Ralston Purina Company: *See—*
Hale, Douglas, 3,748,147.

Ram-Pak, Inc.: *See—*
Capps, William T., Sr.; and Hunnam, Robert J., 3,747,519.

Ramachandran, Sundaresan, to Allegheny Ludlum Industries, Inc. Method for dynamically controlling decarburization of steel. 3,748,122, Cl. 75-60.000.

Ramusino, Francesco Cotta: *See—*
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Ranger, Robert: *See—*
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Rankin, Gordon W.; and Hooker, James R., to United States of America, Atomic Energy Commission. Method of making particles from an aqueous sol. 3,748,274, Cl. 252-301.10s.

Rapistan, Incorporated: *See—*
Daigle, Jack R.; Matthews, Mark G.; and Zollinger, Howard A., 3,747,781.

Rasmussen, Robert F.: *See—*
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Rathburn, Richard P.; and Stanton, Garth M., to Chevron Research Company. Ultrasonic inspection apparatus using certain polymeric materials as couplants. 3,747,398, Cl. 73-67.900.

Rattan, William D., to Robertshaw Controls Company. Thermally responsive switch and method for making the same. 3,747,208, Cl. 29-622.000.

Rauhut, Herbert: *See—*
Frommeld, Hans-Dieter; and Rauhut, Herbert, 3,748,140.

Rauhut, Otto A., to Wide Range Electronics Corporation. Sound recording device with commonly liftable mounting arms for a plurality of heads which are individually adjustable. 3,748,406, Cl. 179-100.2ca.

Rauner, Frederick J.: *See—*
Arcesi, Joseph A.; Rauner, Frederick J.; McConkey, Robert C.; and Noonan, John W., 3,748,132.
Noonan, John M.; McConkey, Robert C.; Arcesi, Joseph A.; and Rauner, Frederick J., 3,748,133.

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Visioli, Armando Joseph, Jr.; and Wittlinger, Harold Allen, 3,748,591.
Warren, Henry Ray, 3,748,408.
Re, Frank M., to Dual Manufacturing and Engineering, Incorporated. Rocker/recliner chair. 3,747,973, Cl. 297-84.000.
Reader, Arthur J. Method and apparatus for mail distribution. 3,747,752, Cl. 209-71.000.
Redd, Keith L., to General Motors Corporation. Windshield and windshield wiper de-icer. 3,747,500, Cl. 98-2.100.
Rederiaktiebolaget Nordstjernan: *See—*
Millgard, Lars Olof Anders; and Sjolin, Ulf Peter Trygveson, 3,748,047.
Reed, Bert H., Jr., to Midwest Products of Chicago, Inc. Cement package. 3,747,744, Cl. 206-47.00r.
Reed, George G., Jr.; Karpinski, Janusz M.; and Fox, Sidney V., to Bethlehem Steel Corporation. Method for producing metallic iron powder from iron ore concentrate. 3,748,116, Cl. 75-3.000.
Reen, Orville W.; and Conner, Jesse R., to Allegheny Ludlum Industries, Inc. Corrosion resistant powder metal parts. 3,748,105, Cl. 29-182.100.
Reese, Dale C. Wall or floor safe. 3,747,541, Cl. 109-50.000.
Refuse Compaction Ltd.: *See—*
Wood, Eric, 3,747,516.
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Reichert, August. Apparatus for extracting and feeding tubes to a machine for filling the tubes with a suitable material. 3,747,786, Cl. 214-309.000.
Reid, Jerome L.: *See—*
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Reilly, Joseph J., to Monsanto Company. Method and apparatus for venting and releasing plastic articles from a blow mold. 3,747,625, Cl. 137-102.000.
Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Printed wiring cable termination. 3,748,628, Cl. 339-17.00f.
Reiner, Robert Leopold, to Cleveland Machine Controls Inc., mesne. Self-tuned vibratory feeder. 3,748,553, Cl. 318-128.000.
Reinert, Guenther: *See—*
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Reinhall, Rolf Bertil. Apparatus for dividing up a mass of small particles into part streams. 3,747,622, Cl. 137-262.000.
Reinhart, Franz Karl, to Bell Telephone Laboratories, Incorporated. Optical modulators. 3,748,597, Cl. 332-7.510.
Reitsma, Hantje, to U.S. Philips Corporation. Video contour determining circuit. 3,748,382, Cl. 178-7.100.
Relyea, Lloyd A.: *See—*
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Remillieux, Paul, to Societe Anonyme D.B.A. Antiskid device for a vehicle braking system. 3,747,989, Cl. 303-21.00p.
Remy, Roger. Electrical contact device. 3,748,373, Cl. 174-115.000.
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Retzler, William, to Colibri Lighters Limited. Cigarette lighter. 3,748,086, Cl. 431-131.000.
Rexroad, James O., to Westinghouse Electric Corporation. Terminal member for circuit interrupter. 3,748,420, Cl. 200-168.00r.
Reynolds, Allan L., to International Telephone and Telegraph Corporation. Multiple diode coaxial cavity oscillator with manual and varactor diode tuning. 3,748,596, Cl. 331-101.000.
Reynolds, George A.; Laakso, Thomas M.; Borden, Douglas G.; and Williams, Jack L. R., to Eastman Kodak Company. Photosensitive composition and element comprising light-sensitive polymers. 3,748,131, Cl. 96-35.100.
Reynolds, Richard W., to Welding Research, Inc. Wire attitude control. 3,748,435, Cl. 219-130.000.
Rhodes, Paul Cephas, to Imperial Chemical Industries Limited. Anchor means. 3,747,552, Cl. 114-206.00r.
Rhone-Poulenc S.A.: *See—*
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Riba, Morris. Rotatable display clock. 3,747,319, Cl. 58-2.000.
Ribe, Fred L.; Burnett, Sibley C.; and Ellis, William R., to United States of America, Atomic Energy Commission. Pulsed high-beta fusion reactor. 3,748,226, Cl. 176-3.000.
Ribour, Jean Louis; and Poullain, Michel Georges, to International Standard Electric Corporation. Apparatus for feeding a single sideband receiver. 3,748,584, Cl. 325-492.000.
Ric-Wil, Incorporated: *See—*
Couch, Robert O.; and Spalding, Donald K., 3,747,961.
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Richards Manufacturing Company: *See—*
Erlichman, Stanton Roy; Woolf, Harold; and Baker, Norman, 3,747,190.
Richardson, Edwin A., to Shell Oil Company. Plugging solution precipitation time control by epoxide. 3,747,677, Cl. 166-293.000.
Richman, Jay Lewis, to Pennwalt Corporation. Molten metal pouring device having pantograph tilting mechanism. 3,747,808, Cl. 222-166.000.
Richter, Sidney B.; and Stach, Leonard J., to Velsicol Chemical Corporation. Phosphoramidate esters. 3,748,335, Cl. 260-294.80k.
Riddle, Robert K., Sr. Releasable boat anchor. 3,747,553, Cl. 114-208.00a.
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Rietdijk, Johan Adriaan: *See—*
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Rigden, Jameson Dane, to Perkin-Elmer Corporation, The. Helium-cadmium laser and method for optimum operation. 3,748,595, Cl. 331-94.500.
Riggs & Lombard, Inc.: *See—*
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Rigsby, Thayer B.; and Rigsby, Burl K. Tool for removal and replacement of half moon shaft locks. 3,747,195, Cl. 29-267.000.
Rigterink, Raymond H., to Dow Chemical Company, The. 2,6-Bis(trifluoromethyl)-4-pyridinols. 3,748,334, Cl. 260-297.00r.
Riitano, Francesco: *See—*
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Rikli, Eldon L. Compensating linkage. 3,747,422, Cl. 74-99.000.
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Rilling, Harry L., to Midway Fishing Tool Co. Oil well mandrel and stabilizing sleeve assembly. 3,747,700, Cl. 175-323.000.
Ringer, Charles Judd, to Ringer, Judd, Corporation. Receptacle for lawn debris. 3,747,653, Cl. 150-1.000.
Ringer, Judd, Corporation: *See—*
Lovness, Donald E., 3,747,260.
Ringer, Charles Judd, 3,747,653.
Ritsema, Irving R.; and Goerke, Frederick E., to Bendix Corporation, The. Pneumatic variable orifice for adaptive braking. 3,747,991, Cl. 303-21.00f.
Rittner, Siegbert: *See—*
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Ritz, Hermann; Gorlitz, Hans; and Jendis, Anneliese, to Siemens & Halske Aktiengesellschaft. Circuit arrangement for attenuation compensation in telecommunication subscriber stations. 3,748,400, Cl. 179-81.00b.
Ro, Rolland Shih-Yuan: *See—*
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Robaczek, Edward, to Mako Apparatebau Fritze Brede. Type wheel setting and locking means and print actuating means in selective printers. 3,747,517, Cl. 101-93.00r.
Robbins Incubator Co.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,747,568.
Robbins, Jack W. Clarinet. 3,747,460, Cl. 84-382.000.
Roberson, Donald Keith, to Motorola, Inc. Hermetically sealed semiconductor package and method of manufacture. 3,748,543, Cl. 317-234.00r.
Roberts, Edward R.: *See—*
Morrison, Charles R.; Sage, Howard A.; and Roberts, Edward R., 3,748,458.
Roberts, Leonard N. Method of fracturing a formation using a liquid explosive. 3,747,679, Cl. 166-299.000.
Roberts, Lisle H.: *See—*
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Roberts, Maurice; Harris, John Derek; Humpage, Roy William; and Crow, Geoffrey George, to Lucas, Joseph, (Industries) Limited. Battery plate coating apparatus. 3,747,560, Cl. 118-57.000.

Roberts, Robert E., to Under Sea Industries, Inc. Inflatable vest having a quick-release hose connection to supply tank. 3,747,140, Cl. 9-319.000.

Roberts, Thomas G.: *See—*
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Robertshaw Controls Company: *See—*
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Robins, Milton: *See—*
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Robinson, Henry G., to Lamson & Sessions Co. Stackable dispenser container. 3,747,833, Cl. 229-17.00r.

Robinson, Samuel C., to Robinson-Nugent, Inc. IC unit carrier and its electrical interconnectors. 3,748,630, Cl. 339-74.00r.

Robinson-Nugent, Inc.: *See—*
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Robra, Helmut, to Schloemann Aktiengesellschaft. Drop forging press. 3,747,393, Cl. 72-455.000.

Rockwell Manufacturing Co.: *See—*
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Roda, Donato, to Faltex-Falzmaschinenfabrik AG. Machine for making concertina folds with reversible roller and means for reversing same. 3,747,917, Cl. 270-68.00r.

Rodenkirch, Mathew E.: *See—*
Wilson, Francis B.; and Rodenkirch, Mathew E., 3,748,565.

Rodier, Christian; and Carre, Paul, to Societe d'Optique Precision Electronique et Mecanique. Mounting for a zoom lens. 3,748,024, Cl. 350-255.000.

Rogers Machinery Company, Inc.: *See—*
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Rohr Industries, Inc.: *See—*
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Rosansky, Martin G.; and Jagid, Bruce E., to Power Conversion, Inc. Method for filling sealed batteries. 3,748,186, Cl. 136-175.000.

Rosen, George: *See—*
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Rosen, George, to United Aircraft Corporation. Low noise prop-fan. 3,747,343, Cl. 60-226.00r.

Rosen, Harvey Milton: *See—*
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Rosen, Karl Isac Joel. Thread delivery device or textile machines. 3,747,864, Cl. 242-47.010.

Rosen, Samuel R.: *See—*
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Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Removable dimmer attachment for a portable lamp. 3,748,532, Cl. 315-362.000.

Rosenberg, Bernard L.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,747,568.

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Rosenfeld, Daniel D.; Lippincott, Samuel B.; and Kilsheimer, John R., to Esso Research and Engineering Company. Halo substituted oxime carbamates. 3,748,361, Cl. 260-566.0ac.

Rosman, Irwin E. Rivet fastener system. 3,747,466, Cl. 85-37.000.

Rosman, Irwin E. Rivet fastener system and method. 3,747,467, Cl. 85-37.000.

Ross, Donald S.; and Roberts, Lisle H., to International Imaging Systems. False color radiant energy detection method and apparatus. 3,748,471, Cl. 250-333.000.

Ross, Frank E., to Maytag Company, The. Spin control for centrifugal extractor. 3,747,841, Cl. 233-24.000.

Ross, Irving D., Jr.; and Madland, Thorvald, to Youngstown Steel Door Company, The. Over-travel and return mechanism for door. 3,747,270, Cl. 49-220.000.

Rossire, F. Henry, to Bendix Corporation, The. Image transmission and presentation device. 3,748,016, Cl. 350-96.00b.

Rossmann, Rudolf, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Short trajectory missile. 3,747,533, Cl. 102-92.700.

Roth, Shirley H.: *See—*
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Rothwarf, Frederick; and Flynn, Paul D., to United States of America, Army. Thermally activated spring with improved thermal properties. 3,748,108, Cl. 29-195.500.

Rousseau, Hubert Cecyl Albert: *See—*
Prieur, Lucien Robert; and Rousseau, Hubert Cecyl Albert, 3,748,407.

Rowland, David L. Seating unit. 3,747,977, Cl. 297-445.000.

Roy, Bhairab Nath; and Sekhar, Ranganatha Chandra, to Imperial Chemical Industries, Limited. Slurry explosive compositions containing N,N'-dinitrosopentamethylemetetramine as density control agent. 3,748,200, Cl. 149-30.000.

Royal Wire Products, Inc.: *See—*
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RTE Corporation: *See—*
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Ruben, Murray A., to Voorhees, Alan M., mesne. Electronic cash register. 3,748,452, Cl. 235-168.000.

Ruckel, James R.: *See—*
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Ruckle, Duane L.; Sprague, Robert A.; and Smith, Michael P., to United Aircraft Corporation. Processing for the high strength alpha-beta titanium alloys. 3,748,194, Cl. 148-12.700.

Ruggen, Werner; Krellmann, Herbert; and Bache, Helmut, to Maschinenfabrik Stromag G.m.b.H. Flexible coupling having friction-increasing means. 3,747,366, Cl. 64-11.000.

Ruiz, Edward F.: *See—*
Moreno, Isabel L.; and Ruiz, Edward F., 3,748,079.

Runkle, Dean E., to Bendix Corporation, The. By-pass flow diffuser. 3,747,475, Cl. 91-445.000.

Runstadler, Peter W., Jr.: *See—*
Nord, Eric T.; Rosen, Samuel R.; Scarbrough, Don R.; Vilagi, Burton J.; and Runstadler, Peter W., Jr., 3,747,852.

Ruohola, Tuomo; Nyberg, Pauli Unto Juhani; Joutsen, Ero Oskari; and Ennelin, Kullervo, to Oy Tampella AB. Method and device for the treatment of refuse. 3,747,542, Cl. 110-8.00r.

Rusanov, Ivan Ivanovich: *See—*
Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich, 3,747,149.

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Russ, Paul E., Sr., to Gates Rubber Company, The. Edge rib for endless track. 3,747,994, Cl. 305-35.0eb.

Russ, Paul E., Sr., to Gates Rubber Company, The. Reinforcement for endless track. 3,747,995, Cl. 305-35.0eb.

Russakov, Irwin J.: *See—*
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Russell, Alexander, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the. Position detection and control devices. 3,748,486, Cl. 250-231.00r.

Russell, Derek Vincent: *See—*
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Russell Holdings Limited: *See—*
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Russell, Robert Louis. Drum beater. 3,747,464, Cl. 84-422.000.

Russell, Stanley L.: *See—*
Gueldenpfennig, Klaus; and Russell, Stanley L., 3,748,390.

Russell, Wayne B., Jr. Self-loading drill rig hopper. 3,747,697, Cl. 175-88.000.

Ruthrof, Klaus, to Siemens Aktiengesellschaft. Device for separating solids and other foreign bodies from liquids in a pipe conduit. 3,747,771, Cl. 210-409.000.

Rutledge, James L., to Motorola, Inc. Integrated circuit fabrication method. 3,747,200, Cl. 29-571.000.

Rybka, Bruno: *See—*
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S&C Electric Company: *See—*

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Saba, Philip B., to Stromberg-Carlson Corporation. Key telephone system line circuit. 3,748,405, Cl. 179-99.000.

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Sakaguchi, Keiichi; Furukawa, Hiroshi; Komine, Yoshio; and Shimazaki, Mamoru, to Canon Kabushiki Kaisha. Film transport control device for a motion picture camera. 3,748,029, Cl. 352-91.000.

Sakai, Ichio: *See—*
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Sakais, Gerald, to S&C Electric Company. Locking mechanism. 3,748,621, Cl. 337-173.000.

Salamony, James E.: *See—*
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Salem, Nasr. Ball and rod linkage for joining polyhedral members. 3,747,261, Cl. 46-26.000.

Saliga, Thomas V.: *See—*
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Salkoff, Goodwin; and Nusbaum, Elmer R., to Atlas Metal Industries, Inc. Corner clamps for shelving and the like. 3,747,540, Cl. 108-156.000.

Salo, Esko. Blade wheel for rotary snow plough. 3,747,240, Cl. 37-43.00b.

Salzer, Thomas E.: *See—*
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Samson, Rogelio G.: *See—*
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Samura, Hiroyoshi; Nagashima, Mitsuyoshi; and Washimine, Osamu, to Citizen Watch Co., Ltd. Transfer machine. 3,747,185, Cl. 29-200.00a.

Sanchez, Luis T.: *See—*
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Sanderson, Robert W., III: *See—*
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Sansha Electric Manufacturing Company, Limited: *See—*
Arai, Hiroshi; Komuro, Yoshiaki; and Kasai, Akinari, 3,748,567.

Santilli, Arthur A.; and Kim, Dong H., to American Homes Products Corporation. Dialkyl 2-[1-(3-thiosemicarbozono)ethyl] alkylenedioates. 3,748,352, Cl. 260-481.00r.

Santos, Manuel Valente. Multiply adjustable surgical retractor. 3,747,592, Cl. 28-20.000.

Sapal Societe Anonyme des Plieuses Automatiques: *See—*
Fuchs, Werner; and Kramer, Ulrich, 3,747,739.

Sardo, Vincent, Jr. Seat belt system for automotive vehicles. 3,748,640, Cl. 340-52.00e.

Sargent, Frank T.; and Andersen, James M., to Thetford Corporation. Self contained flush toilet having slide valve. 3,747,130, Cl. 4-17.000.

Sarier, Ingrid: *See—*
Sarier, Kaya; and Sarier, Ingrid, 3,747,246.

Sarier, Kaya; and Sarier, Ingrid. Information display apparatus. 3,747,246, Cl. 40-86.000.

Sarkisov, Rafael Tevosovich: *See—*
Gilev, Vitaly Konstantinovich; Evzlin, Volf Nakhimovich; Sarkisov, Rafael Tevosovich; and Stepanian, Ernst Arakelovich, 3,747,452.

S.A.S. Officine Meccaniche Innocente Reganti di Innocente e Franco Riganti: *See—*
Dalia, Piero, 3,748,370.

Sasaki, Ichiro: *See—*
Mizutani, Norio; Sasaki, Ichiro; Ito, Takamitsu; Ueno, Hiroshi; Nishizaki, Shoichi; and Ishizuka, Tetsuo, 3,748,324.

Sato, Chuichi: *See—*
Inoue, Gentei; Sato, Chuichi; and Tanaka, Mamoru, 3,747,470.

Sato, Kozi: *See—*
Tanaka, Atsushi; Sawada, Hideo; Toba, Hirotaka; Kuumoto, Mashahiko; and Sato, Kozi, 3,748,286.

Satriana, Daniel R., to United States of America, Army. Process for the manufacture of lead beta-re-sorcylates. 3,748,349, Cl. 260-435.000.

Savage, Czerney L. Fast idle adaptor for a diesel engine. 3,747,580, Cl. 123-140.00j.

Savery, Ralph, to Dowty Rotol Limited. Fluid spring shock absorbers. 3,747,913, Cl. 267-64.00r.

Sawa, Kunihiko; Kinoshita, Shigenori; and Kaimoto, Masahiro, to Fuji Denki Seizo Kabushiki Kaisha. Device including thyristor chopper for controlling inductive load. 3,748,560, Cl. 318-430.000.

Sawada, Hideo: *See—*
Tanaka, Atsushi; Sawada, Hideo; Toba, Hirotaka; Kuumoto, Mashahiko; and Sato, Kozi, 3,748,286.

Sawyer, Robert H., to Cartridge Actuated Devices, Inc. Explosive type circuit breaker with frangible printed circuit board. 3,748,413, Cl. 200-61.080.

Sayles, John H.; and Pekar, Allen L., to Universal Oil Products Company. Control system for a reaction process system. 3,748,448, Cl. 235-151.120.

Scanlon, John Michael: *See—*
Casterline, Russell Carson; Garraty, William Clayton; and Scanlon, John Michael, 3,748,389.

Scarbrough, Don R.: *See—*
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Nord, Eric T.; Rosen, Samuel R.; Scarbrough, Don R.; Vilagi, Burton J.; and Runstadler, Peter W., Jr., 3,747,852.

Scarlett, John C.: *See—*
Beggs, Donald; and Scarlett, John C., 3,748,120.

Schafer, Hans, to Siemens Aktiengesellschaft. Induction coil for induction heating of moving articles. 3,748,422, Cl. 219-10.530.

Schaffner, Gerald, to Teledyne Ryan Aeronautical. Voltage variable non-induction phase shifter with monolithic implementation. 3,748,499, Cl. 307-295.000.

Schartmann, Knut Roger; and Warner, Wesley John, to Northern Electric Company Limited, mesne. Line circuit for a key telephone system. 3,748,403, Cl. 179-99.000.

Scheidell, John P. Toothbrush sterilization device. 3,748,094, Cl. 21-83.000.

Schenkel, Klaus Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for determining the existence of a calling condition on channels of a multiplex radiotelephone communication system. 3,748,398, Cl. 179-41.00a.

Schering A.G.: *See—*
Vorbruggen, Helmut, 3,748,320.

Schevey, William R., to Allied Chemical Corporation. Additive for nickel plating baths. 3,748,236, Cl. 204-49.000.

Schill, Hermann; deceased (by Schill, Hermann, Jr.; administrator). Bacon derinding machine. 3,747,512, Cl. 99-589.000.

Schill, Hermann, Jr.: *See—*
Schill, Hermann, 3,747,512.

Schill, Jurgen Henrich, to Sulzer Brothers Limited. Circulating system for a nuclear pressure vessel. 3,748,229, Cl. 176-65.000.

Schinkelsh, Jacob: *See—*
Versluis, Rueland; Schinkelsh, Jacob; and Schuurman, Peter J., 3,747,308.

Schjeldahl, G. T., Company: *See—*
Adams, Richard C., 3,748,205.

Schlafhorst & Co.: *See—*
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Schlegel Manufacturing Company, The: *See—*
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Schlein, Herbert N.: *See—*
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Schlein, Kai Frederik: *See—*
Hazzard, Robert D.; Trotter, Peter H.; Schlein, Kai Frederik; and Clute, Angelo, 3,748,011.

Schleppnik, Alfred A.: *See—*
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Schloemann Aktiengesellschaft: *See—*
Robra, Helmut, 3,747,393.

Schluckebier, Floyd A., to General Motors Corporation. Adjustable steering column. 3,747,426, Cl. 74-492.000.

Schlumberger Technology Corporation: *See—*
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Schmeider, Melvin G.: *See—*
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Boke, Reinhard; Schmid, Alfred; and Wilke, Heinz, 3,747,188.

Schmidt, Donald L.; and Smith, Hugh B., to Dow Chemical Company, The. Fishing line with cyclic sulfonium zwitterion-fluoro-carbon coating. 3,748,168, Cl. 117-72.000.

Schmidt, Gerald W.; Jones, Lawrence Temple; and Smith, Jay, III, to California R & D Center. Musical toy. 3,747,459, Cl. 84-94.00r.

Schmidt, John E.; and Metcalfe, Robert P., to BASF Wyandotte Corporation. Distribution of electric current in an electrolytic cell anode. 3,748,250, Cl. 204-266.000.

Schmidt, Manfred; and Stieler, Fred, to Metallgesellschaft Aktiengesellschaft. Process of making a Waelz oxide containing sinter for use in zinc smelting furnaces. 3,748,117, Cl. 75-5.000.

Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, to Merck Patent Gesellschaft mit beschrankter Haftung. Indicator for the detection of copper ions. 3,748,096, Cl. 23-230.00r.

Schmolka, Irving R., to BASF Wyandotte Corporation. Aqueous gel composition containing polyether polyol gelling agents. 3,748,276, Cl. 252-316.000.

Schneider, Edmund: *See—*
Holly, James A.; and Schneider, Edmund, 3,747,160.

Schneider, Herman H., to Hamm, Theodore, Brewing Co. Drum-supporting structure. 3,747,780, Cl. 214-10.50r.

Schneider, Jean-Claude, to Fabrique d'Horlogerie Chs. Tissot et Fils, S.A. Pivoting device for a horology movement including a synthetic bearing. 3,747,325, Cl. 58-140.000.

Schneider, Jos., & Co. Optische Werke: *See—*
Versari, Werner Rio; and Kirstein, Lothar, 3,747,570.

Schneider, Josef. Advertising device with flickering light effect. 3,747,243, Cl. 40-30.000.

Schnellmann, Oskar, to Kretag Aktiengesellschaft. Film splicing apparatus. 3,748,208, Cl. 156-443.000.

Schnipke, Dennis E., to Bendix Corporation, The. Relay valve for electro-pneumatic control system. 3,747,992, Cl. 303-40.000.

Schofer, Rudolf: *See—*
Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 3,748,503.

Schoffmann, Rudolf, to Vereinigte Osterreichische Eisen- und Stahlwerk Aktiengesellschaft. Process for the treatment of cast bars in continuous casting plants. 3,747,664, Cl. 164-76.000.

Scholdstrom, Ragnar, to AGA Aktiebolag. Reflector for distance measurement. 3,748,026, Cl. 350-287.000.

Schott, Charles M., Jr., to Gloucester Engineering Co., Inc. Forming machine with web transport. 3,748,078, Cl. 425-383.000.

Schrenk, Walter J.: *See—*
Newman, Ritchey O., Jr.; and Schrenk, Walter J., 3,748,218.

Schroll, Josef; and Sroke, Werner, to VEB Ingenieurburo Schiffbau. Centrifugal casting apparatus. 3,747,668, Cl. 164-287.000.

Schubert, Karl P., to Acme-Cleveland Corporation. Machine tool transmission. 3,747,444, Cl. 82-28.00r.

Schuder, Maurice E.: *See—*
Weber, Richard H.; and Schuder, Maurice E., 3,747,420.

Schultz, Steven H.; and Unruh, Rudy R., to Daktronics, Inc. Voting system. 3,748,646, Cl. 340-172.00s.

Schutrum, Walter L.: *See—*
Kyle, Thomas A.; and Schutrum, Walter L., 3,748,032.

Schutze, Rainer. Keyboard instrument. 3,747,465, Cl. 84-436.000.

Schuurman, Peter J.: *See—*
Versluis, Rueland; Schinkelsh, Jacob; and Schuurman, Peter J., 3,747,308.

Schwan, Thomas J.; and White, Ralph L., Jr., to Norton-Norwich Products, Inc. 5-Hydroxy-1-[(5-nitrofurfurylidene)amino]hydantoin. 3,748,326, Cl. 260-240.00a.

Schwermann, Hans-Jurgen, to Windmoller & Holscher. Equipment for applying a roll of paper or plastics web to a winding apparatus. 3,747,866, Cl. 242-58.600.

Schwitzer, Louis H., III. Air circulation control system. 3,747,671, Cl. 165-26.000.

SCM Corporation: *See—*
Gilchrist, Allan Boyd Earl, 3,748,244.
Peeling, John E., Jr., 3,748,171.

Scott & Fetzer Company, The: *See—*
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Scott, Dale K.: *See—*
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Scriven & Paget Limited: *See—*
Paget, Arthur Averil, 3,747,315.

Se-Kit, Yuen. Tape dispenser. 3,747,816, Cl. 225-11.000.

Seals, William O.; and Picard, Jean, to United States of America, Army. Combustible water repellent coating. 3,748,161, Cl. 106-181.000.

Sebestyeh, Thomas M.: *See—*
Fenton, James E.; Samson, Rogelio G.; and Sebestyeh, Thomas M., 3,747,340.

Secor, Nelson A.: *See—*
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Sedlecky, Jaromir; Matejka, Josef; Milichovsky, Bohumil; and Eisner, Olrich, to Statni Vyzkumny Ustav Textilni. Needle mounting arrangement. 3,747,373, Cl. 66-120.000.

Seeger, Robert W. Spring resistant type exercising device. 3,747,925, Cl. 272-83.00a.

Seelbach, Bernard H., to Seelbach, K. C., Co., Inc. Apparatus for processing foodstuffs. 3,747,513, Cl. 99-476.000.

Seelbach, K. C., Co., Inc.: *See—*
Seelbach, Bernard H., 3,747,513.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Coupling networks having broader bandwidth than included phase shifters. 3,748,601, Cl. 333-10.000.

Seiffert, Ulrich: *See—*
Goes, Friedrich; Seiffert, Ulrich; Hinzmann, Dieter; and Borenius, Gunnar, 3,747,953.

Seiler, Viktor: *See—*
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Seipel, John J.; Roth, Shirley H.; and Green, Joseph, to Cities Service Company. Intumescent coating composition comprising aromatic sulfonamides. 3,748,154, Cl. 106-15.0fp.

Seitz-Werke G.m.b.H.: *See—*
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Sekhar, Ranganatha Chandra: *See—*
Roy, Bhairab Nath; and Sekhar, Ranganatha Chandra, 3,748,200.

Seki, Shiro: *See—*
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Sellers, Harold: *See—*
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Sellstedt, John H.: *See—*
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Seltzer, Daniel A., to Gamon-Calmet Industries, Inc. Remote self-contained portable readout device. 3,748,539, Cl. 317-120.000.

Senturia, Stephen D.; Wilson, David G.; and Windkler, Paul Frank, Jr., to Massachusetts Institute of Technology. Apparatus for determining diffuse and specular reflections of infrared radiation from a sample to classify that sample. 3,747,755, Cl. 209-111.00.

Sergeeva, Ljudmila Semenovna: *See—*
Fedjukin, Dmitry Lvovich; Sergeeva, Ljudmila Semenovna; Bakharev, Andrei Nikolaevich; Korochkin, Petr Evmenovich; Aronov, Anatoly Izrailevich; Gorlina, Inna Leonidovna; Kravets, Arkady Timofeevich; Goloskov, Emmanuil Isaakovich; Annenberg, Ernest Alexandroich; Fedotova, Svetlana Evgenievna; and Bezverkhny, Grigory, 3,747,281.

Serino, Vincenzo. Closure or seal for doors, packages and the like. 3,747,163, Cl. 24-16.0pb.

Serrat, Martin Llahi. Device for the helicoidal mounding and unmoulding of natural and artificial fibres, especially hair. 3,747,610, Cl. 132-9.000.

Seymour, Lynn L.: *See—*
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Shaffer, William E., to Stromberg-Carlson Corporation. Telephone ring-trip circuit. 3,748,391, Cl. 179-84.00r.

Shakhnov, Anatoly Fedorovich: *See—*
Melbard, Sergei Nikolaevich; Shakhnov, Anatoly Fedorovich; Gelman, Alexandr Shmulevich; Slepak, Moscowiezra Shmulevich; Oblasti, Malakhovka Moskovskoi; Vivsik, Svyatoslav Nikolaevich; Bondarev, Anatoly Ivanovich; Desyatskov, Leonid Pavlovich; and Morozov, Iadimir Sergeevich, 3,748,431.

Shannon, John Martin, to U.S. Philips Corporation. Methods of manufacturing a semiconductor device. 3,747,203, Cl. 29-578.000.

Sharabash, Moustafa M., to Lilly, Eli, and Company. Test apparatus for film-forming materials. 3,747,397, Cl. 73-64.100.

Shark, Sam: *See—*
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Shatas, Romas A.; Meyer, Harry C., III.; Stettler, John D.; and Roberts, Thomas G. Neutron generator axially assisted by laser. 3,748,475, Cl. 250-502.000.

Shaw, Robert F.: *See—*
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Shearon, Michael Hillas: *See—*
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Sheker, Roger N.: *See—*
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Shekerjian, Hart; and Louis, George A., to Motorola, Inc. Encapsulated high voltage power supply with disconnectable high voltage output lead and method of making same. 3,748,538, Cl. 317-118.000.

Shell Oil Company: *See—*
Abrams, Albert, 3,747,680.
De Pasquale, Ralph J., 3,748,345.
Feenstra, Robijn; and Pols, Albert C., 3,747,699.
Fort, Eldon R.; Prescott, Basil O.; and Walters, Arley, 3,747,405.
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Richardson, Edwin A., 3,747,677.
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Shelton, Joe: *See—*
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Shepperd, William: *See—*
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Sherman, Charles R., to Bendix Corporation, The. Master for monitoring fluid flow type surface roughness gages. 3,747,395, Cl. 73-1.00r.

Sherwood, Charles D.; and Cordier, James R., to Hardinge Brothers, Inc. Quick acting carriage shifting mechanism for a lathe. 3,747,443, Cl. 82-24.00r.

Shillinger, Joseph F., to Champion International Corporation. One piece folding carton with drawer. 3,747,834, Cl. 229-20.000.

Shimazaki, Mamoru: *See—*
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Shipley, John Robson; and Russell, Derek Vincent, to Fork Lift Truck Patentees Establishment. Load handling vehicle. 3,747,789, Cl. 214-671.000.

Shivak, Robert A., to Cajon Company. High vacuum flange assembly with O-ring gasket. 3,747,963, Cl. 285-336.000.

Shockley, Quentin O.: *See—*
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Shular, Howard Edward, to Pyrnnics, Inc. Burner apparatus and method for flame propagation control. 3,748,087, Cl. 431-182.000.
Shumaker, Charles Storer, to Wean United, Inc. Roll changing arrangement for a rolling mill. 3,747,387, Cl. 72-239.000.
Shutt, Sidney G. High speed sailboat. 3,747,549, Cl. 114-39.000.
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., to General Signal Corporation. Vehicle control system. 3,748,466, Cl. 246-63.00r.
Sidlauskas, Donald M. Flotation shoes. 3,747,236, Cl. 36-2.5aa.
Sieber, Robert L., to General Electric Company. Variable speed drive having enhanced ventilation. 3,748,507, Cl. 310-58.000.
Siemens & Halske Aktiengesellschaft: *See—*
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Silver, H. Graham, to General Telephone & Electronics Laboratories, Inc. Electric discharge lamp having a fill including niobium pentaiodide complexed with an inorganic oxo-compound as the primary active component. 3,748,520, Cl. 313-184.000.
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Skipper, Claud T., to Productive Instruments & Machine, Inc. Circle metal cutter. 3,747,911, Cl. 266-23.00m.
Skischuhfabrik Dynafit GmbH: *See—*
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Sloan, Raymond L.; and Sloan, Harold L. Cart for transporting monuments or the like. 3,747,787, Cl. 214-390.000.
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Smirl, Richard L., to Borg-Warner Corporation. Constant speed centrifugal clutch. 3,747,731, Cl. 192-104.00r.
Smith, Albert C., Jr., to Eastman Kodak Company. Coupler dispersions utilizing cyclohexane-containing esters as coupler solvents. 3,748,141, Cl. 96-100.000.
Smith, David A.: *See—*
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Smith, Donald L., to United States of America, Atomic Energy Commission. Method of measuring fast-neutron flux. 3,748,472, Cl. 250-371.000.
Smith, Gerald E. M. Horseshoe assembly. 3,747,683, Cl. 168-25.000.
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Smith, Jean G., to United States of America, Atomic Energy Commission. Preparation of sols by hydrogen reduction of nitrate solutions. 3,748,273, Cl. 252-301.10s.
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Smith, Paul W.: *See—*
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Smith, Raymond L., Jr., to C & M Manufacturing Company, Inc. Double side shifting fork-type stacker. 3,747,790, Cl. 214-730.000.
Smith, Robert McKee: *See—*
Mc Fowen, James Royce; Opferman, David Clement; and Smith, Robert McKee, 3,748,649.
Smith, Shirley M.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,747,568.
Smith, Willis R.: *See—*
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., 3,748,466.
Smithe, F. L., Machine Company, Inc.: *See—*
Helm, Herbert W., 3,747,561.
Smiths Industries Limited: *See—*
Beardmore, Geoffrey, 3,747,417.
Smulders, Hendricus Franciscus Gerardus: *See—*
Holster, Peter Leendert; and Smulders, Hendricus Franciscus Gerardus, 3,747,628.
Holster, Peter Leendert; Smulders, Hendricus Franciscus Gerardus; and Baert, Roger Bertrand, 3,747,645.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Delfrate, Egidio Alvazzi; and De Nicolay, Giuliano, 3,748,602.
Societe Anonyme DBA: *See—*
Morin, Gerard, 3,747,368.
Morin, Gerard, 3,747,369.
Remillieux, Paul, 3,747,989.
Tanguy, Christian, 3,747,990.
Societe Anonyme dite: *See—*
de Lavalette, Pierre de Lacroix, 3,748,239.
Societe Anonyme: Poclain: *See—*
Gauchet, Yves M., 3,747,718.
Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicoles-E.R.S.M.E.: *See—*
Pedrazzoli, Andrea; and Astay, Leone Dall, 3,748,346.
Societe d'Etudes Recherches et Construction Electroniques S.E.R.C.E.L.: *See—*
Aumiaux, Michel, 3,748,587.
Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: *See—*
Kamiya, Takashi; and Hashimoto, Masashi, 3,748,341.
Societe d'Optique Precision Electronique et Mecanique: *See—*
Rodier, Christian; and Carre, Paul, 3,748,024.
Societe Francaise de l'Electro-Resistance: *See—*
Maurice, Jean, 3,748,626.
Societe Industrielle Honeywell Bull: *See—*
Torrens, Christian, 3,747,522.
Societe Industrielle Honeywell Bull (Societe Anonyme): *See—*
DeBruyne, Guy Jules Achille Pierre; and Bienvenu, Jacques Michel Jean, 3,748,653.
Prieur, Lucien Robert; and Rousseau, Hubert Cecyl Albert, 3,748,407.
Venker, Hilrich Jan Matthijs, 3,748,613.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Bouiller, Jean Georges; Lacroix, Armand Jean-Baptiste; and Bauger, Louis Jules, 3,748,058.

Sokulova, Maria Stepanovna: *See—*
Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Denisovich, Boris Anatolievich, 3,747,149.

Solvay & Cie: *See—*
Christiaens, Bernard; and Martens, Guy, 3,748,243.

Somasekhara, Shankar; and Dighe, Vijaya Shanker. Process for the preparation of quinazolinone derivatives. 3,748,325, Cl. 260-240.00e.

Sommer, Harry J.; McLaren, Gordon A; Feichtmeir, Edmund F.; Larsen, Robert G.; and Wittsell, Lawrence E., to Shell Oil Company. Plant nutrient products. 3,748,115, Cl. 71-64.00f.

Sonnenberg, Fred Max: *See—*
Collette, John Wilfred; Ro, Rolland Shih-Yuan; and Sonnenberg, Fred Max, 3,748,316.

Sony Corporation: *See—*
Arai, Michio, 3,747,201.
Esashi, Hanjiro; and Matsumoto, Tomio, 3,747,745.
Ohsawa, Mitsuo, 3,748,582.
Uemura, Saburo; and Yanagisawa, Yuzuru, 3,747,175.

Sorg, Ear H.: *See—*
Bulbenko, George F.; Sorg, Ear H.; and Gallagher, John P., 3,748,313.

Sormani S.p.A.: *See—*
Trassinelli, Duccio, 3,748,463.

Sounders, Norman R.: *See—*
Bridwell, Harold C.; and Sounders, Norman R., 3,747,276.

South, Rubert F., to Beta Engine Systems Corporation. Digital tachometer. 3,748,533, Cl. 317-5.000.

South Shore Machine Co., Inc.: *See—*
Dupee, Donald E.; and Hodgson, William S., 3,747,828.
Hodgson, William S., 3,747,983.

South, William H., to Westinghouse Electric Corporation. Static synchronizer for alternating current generators. 3,748,489, Cl. 307-87.000.

Spalding, Donald K.: *See—*
Couch, Robert O.; and Spalding, Donald K., 3,747,961.

Special Metals Corporation: *See—*
Boesch, William J., 3,748,192.

Speirs, Kenneth K.; Weinstein, Martin; and Blize, Roy L., to Chromalloy American Corporation, The. Magnesium-based coating for the sacrificial protection of metals. 3,748,172, Cl. 117-135.100.

Spellman, Robert D.: *See—*
Case, Oliver P.; Jones, Ronald B. L.; Spellman, Robert D.; and Archambalut, Joseph W., 3,748,124.

Spengler, Erich; and Georges, Gerard, to Volkswagenwerk Aktiengesellschaft. Quick insertion arrangement especially for sparkplugs in combustion engines. 3,747,583, Cl. 123-148.00a.

Spera, Edmond A.: *See—*
Garbarini, Morries P.; and Spera, Edmond A., 3,748,410.

Sperry Rand Corporation: *See—*
Groeber, Eugen, 3,747,922.
Hajicek, James D.; and Sipple, Ralph E., 3,748,447.
West, Donald J.; and Martin, William J., II, 3,747,350.

Speyer, Fred B., to TRW Inc. Method of making investment molds from improved pattern material. 3,748,155, Cl. 106-38.002.

Sprague, Robert A.: *See—*
Ruckle, Duane L.; Sprague, Robert A.; and Smith, Michael P., 3,748,194.

Spransy, Brower C.: *See—*
Spransy, John H.; and Spransy, Brower C., 3,747,928.

Spransy, John H.; and Spransy, Brower C. Elastically tethered ball and target rings. 3,747,928, Cl. 273-98.000.

Squibb, E. R., & Sons, Inc.: *See—*
Krapcho, John, 3,748,321.

Squires, Robert W.: *See—*
Feren, Conrad J.; and Squires, Robert W., 3,748,245.

Sreenivasan, Baratham, to Lever Brothers Company. Directed-interesterified glyceridic oils having a high linoleic acid content and process for their production. 3,748,348, Cl. 260-410.700.

Sroke, Werner: *See—*
Schroll, Josef; and Sroke, Werner, 3,747,668.

SSR Instruments, Company: *See—*
Jensen, Paul K., 3,748,478.

St. Joseph's Hospital and Medical Center: *See—*
Cohen, Melvin L., 3,747,847.

Stach, Leonard J.: *See—*
Richter, Sidney B.; and Stach, Leonard J., 3,748,335.

Stachel, Adolf: *See—*
Beyerle, Rudi; and Stachel, Adolf, 3,748,327.

Stachel, Ingeburg Lydia Katharina: *See—*
Beyerle, Rudi; and Stachel, Adolf, 3,748,327.

Stahlfeld, Donald L.: *See—*
Ko, Daniel Y. C.; and Stahlfeld, Donald L., 3,748,256.

Stahlhuth, Paul H., to Philco-Ford Corporation. Harmonic drive. 3,747,434, Cl. 74-640.000.

Staley, A. E., Manufacturing Company: *See—*
Jones, Rexford W.; and Thompson, William B., 3,748,134.

Standaart, Adrian W. Multi-beam cathode ray tube character display. 3,748,514, Cl. 313-79.00r.

Standard Abrasives: *See—*
Haigh, Jack M., 3,747,286.

Standard Oil Company: *See—*
Elmer, Gary W.; and Muller, Karl A., Jr., 3,747,304.
Stephens, James R., 3,748,304.

Standard Safety Equipment Co.: *See—*
Hoagland, Earl J., 3,747,126.

Stander, Arthur, to United States of America, Navy. Corrosion resistant for aluminum surfaces containing strontium chronate and magnesium powder. 3,748,292, Cl. 260-18.0pn.

Stanford Research Institute: *See—*
Geppert, Donovan V., 3,748,522.

Stanley, Richard Carl, to Midwestern Specialties, Ltd. Means for welding pipe sections. 3,748,426, Cl. 219-60.00a.

Stanley Works, The: *See—*
Tonking, Henry B., Jr., 3,747,481.

Stanton, Garth M.: *See—*
Rathburn, Richard P.; and Stanton, Garth M., 3,747,398.

Stanton, Stephen; Varholy, Edward; and Verwey, William, to Precision Industries, Inc., mesne. Electronically controlled stitching machine. 3,747,827, Cl. 227-100.000.

Stanworth, Colin Graham; Dixon, John; and Jones, David Ian, to British Steel Corporation. Temperature measurement. 3,747,408, Cl. 73-355.0em.

Star Expansion Industries Corporation: *See—*
Eager, William A., 3,747,143.

Statni Vyzkumny Ustav Textilni: *See—*
Sedlecky, Jaromir; Matejka, Josef; Milichovsky, Bohumil; and Eisner, Olrich, 3,747,373.

Stayton Canning Company Cooperative: *See—*
Ireland, Frederick P., 3,747,514.

Steam Engine Systems, Inc.: *See—*
Gerstmann, Joseph; Morse, Richard S.; and Hoagland, Lawrence C., 3,747,333.

Steelcase Inc.: *See—*
Levit, Edward C.; and Van Gessel, Robert C., 3,748,006.

Stein, Alfred: *See—*
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,748,096.

Steinen, Wm., Mfg. Co.: *See—*
Gigantino, Otto M.; Parrill, Victor; and Gigantino, Leonard D., 3,747,892.

Steisslinger, Kurt; Weidenbach, Willi; and Lutz, Ernst, to Eastman Kodak Company. Stand for photographic apparatus. 3,747,884, Cl. 248-181.000.

Stepanian, Ernst Arakelovich: *See—*
Gilev, Vitaly Konstantinovich; Evzlin, Volf Nakhimovich; Sarkisov, Rafael Tevosovich; and Stepanian, Ernst Arakelovich, 3,747,452.

Stephens, James R., to Standard Oil Company. Amide-imide copolymers. 3,748,304, Cl. 260-47.0cp.

Stephenson, Roger C.: *See—*
Phillips, John J.; Posakony, Gerald J.; and Stephenson, Roger C., 3,748,635.

Sternco Industries, Inc.: *See—*
Lovitz, David D., 3,747,566.

Stettler, John D.: *See—*
Shatas, Romas A.; Meyer, Harry C., III.; Stettler, John D.; and Roberts, Thomas G., 3,748,475.

Stevens, Charles W., Jr.: *See—*
Larson, Robert J.; and Stevens, Charles W., Jr., 3,748,637.

Stevens, Emerson W., to United States of America, Air Force. V/STOL aircraft-by-pass engine having a double, thrust diverter valve assembly. 3,747,875, Cl. 244-53.00r.

Stevens, Harry S.; Karr, Jerry W.; Miller, Dennis D.; and Ballinger, Forrest H., to Harmon Electronics, Inc. Elapsed time and terminal speed computer for automotive vehicles. 3,748,580, Cl. 324-178.000.

Stevens, J. P., & Co., Inc.: *See—*
Mercer, Harry L.; and White, William Thomas, 3,748,092.
Tesoro, Giuliana C., 3,748,364.

Stevers, Roger F.: *See—*
Peshina, William J.; Peshina, William F.; and Stevers, Roger F., 3,747,307.

Stewart, James B.; and Lutts, Carlton G., to USM Corporation. Adjustable work pick-up device. 3,747,919, Cl. 271-19.000.

Stieler, Fred: *See—*
Schmidt, Manfred; and Stieler, Fred, 3,748,117.

Stobe, Lothar, to Seitz-Werke G.m.b.H. Method of and apparatus for measuring the filter cake thickness on filter elements of settling tank filters. 3,748,263, Cl. 210-65.000.

Stocker, August; Marti, Othmar; and Pfammatter, Theodul, to Lonza Ltd. A.G. Process for the production of pyridine carboxylic acids. 3,748,336, Cl. 260-295.00r.

Stockmann, Hans H.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process of making paper containing chain extended polyamine resin compositions and paper made therefrom. 3,748,221, Cl. 162-164.000.

Stoeberl, Helmut. Plastic sailboat body and keel assembly. 3,747,550, Cl. 114-39.000.

Stogner, Joel M.: *See—*
Nickles, Stephen K.; Stogner, Joel M.; and Doerksen, James L., 3,747,415.

Stokes, David Howard, to Lever Brothers Company. Detergent compositions. 3,748,267, Cl. 252-89.000.

Stokes, William E., to Motivated Images, Inc. Telephone bracket. 3,748,409, Cl. 179-149.000.

Stone, Louis Earl; and Romano, Roberto, to Texas Instruments, Incorporated. Sliding furnace boat apparatus. 3,747,562, Cl. 118-415.000.

Stone, Norman L. Cabinets and kits for making same. 3,748,009, Cl. 312-263.000.

Stopp, Gerhard: *See*—
Liebsch, Dietrich; Meisert, Ernst; and Stopp, Gerhard, 3,748,329.

Storage Technology Corporation: *See*—
Arthur, William C., 3,748,552.

Storer, John E., Jr., to General Motors Corporation. Friction drive establishing device clearance control mechanism. 3,747,729, Cl. 192-70.280.

Stothart, David C., to Gulf Research & Development Company. Incremental rotational drive. 3,747,848, Cl. 235-94.00r.

Stout, Gilbert T., to Bendix Corporation, The. Friction disc for disc brake. 3,747,712, Cl. 188-73.200.

Strauss, Alan J.: *See*—
Dimmock, John O.; Meingailis, Ivars; and Strauss, Alan J., 3,748,593.

Strauss, Rudolf Siegfried; and Teitz, Peter David, to Fry's Metals Limited. Soldering fluxes. 3,748,191, Cl. 148-23.000.

Streich, Martin, to Linde Aktiengesellschaft. Gas liquefaction by a fractionally condensed refrigerant. 3,747,359, Cl. 62-24.000.

Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., to Memorex Corporation and CMX Systems. Editing system. 3748,381, Cl. 178-6.600.

Stroezel, Reinhold; Vogel, Eberhard; Hettich, Alfred; Bartholoma, Karl; Hahner, Reinhard; and Lederer, Hans, to Bosch, Robert, G.m.b.H. Portable power tool with orbital work-engaging means. 3,747,280, Cl. 51-170.0nt.

Stromberg-Carlson Corporation: *See*—
Davis, Gordon H.; Niertit, Frank; and Root, Bernard H., 3,748,404.
Garrison, Arthur D.; and Hall, Earl L., 3,748,378.
Gueldenpfennig, Klaus; and Russell, Stanley L., 3,748,390.
Jones, Roy W., 3,748,534.
Saba, Philip B., 3,748,405.
Shaffer, William E., 3,748,391.

Strub, Rene, to Brown-Boveri-Sulger Turbomachinery, Ltd. Method and apparatus for controlling a metallurgical furnace turbo compressor. 3,747,335, Cl. 60-39.030.

Stubbert, George: *See*—
Cooper, John; Stubbert, George; and Shepperd, William, 3,748,185.

Stump, Theodore M.: *See*—
Johnson, Robert A.; and Stump, Theodore M., 3,748,586.

Sturman, Brian J., Jr.: *See*—
Kipple, Harry P.; and Sturman, Brian J., Jr., 3,747,853.

Suchiron Kagaku Kogyo Kabushiki Kaisha: *See*—
Ono, Tasuku, 3,747,266.

Suddeutsche Kalkstickstoffwerke Aktiengesellschaft: *See*—
Reingen, Werner, 3,748,290.

Suganuma, Tadao, to Nihon Denshi Kabushiki Kaisha. Scanning electron microscope. 3,748,467, Cl. 250-99.50a.

Sugimori, Shiro: *See*—
Daitoku, Koichi; and Sugimori, Shiro, 3,747,497.

Sugimoto, Eiji, to Nippon Electric Company, Limited. Insulated-gate field effect transistor having gate protection diode. 3,748,547, Cl. 317-235.00r.

Sullivan, Charles E.: *See*—
Knowd, Michael J.; and Sullivan, Charles E., 3,747,703.

Sullivan, Robert H.: *See*—
Armstrong, Robert K.; Brenna, Gerald L.; and Sullivan, Robert H., 3,748,351.

Sully, Frank H.; and Simer, Loren J., to Paddle Pumps Incorporated. Submersible pump. 3,748,066, Cl. 417-424.000.

Sulzer Brothers Limited: *See*—
Schill, Jurgen Henrich, 3,748,229.
Zimmermann, Ulrich, 3,748,228.

Sumitomo Chemical Company, Limited: *See*—
Akamatsu, Takashi; and Kuwahara, Yukio, 3,748,164.

Sun Oil Company of Pennsylvania: *See*—
Young, Einar T., 3,747,624.

Sun Research and Development Co.: *See*—
Hosler, Peter; and Raymond, Richard L., 3,748,231.
Thompson, Robert M., 3,748,359.

Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 3,747,807.

Sunderland, John C.: *See*—
Lippman, Robert L.; and Sunderland, John C., 3,748,476.

Sunstein, David E. Television image-display system. 3,748,375, Cl. 178-5.40f.

Susquehanna Corporation, The: *See*—
Layer, Gerard E.; Yates, John S.; and Kreuzer, John A., 3,747,873.

Sutherland, Ray, to Rockwell Manufacturing Co. Remote meter readout station with pull-off cover. 3,748,654, Cl. 340-177.00r.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Acceleration responsive switch with magnetic actuator means. 3,748,415, Cl. 200-61.45m.

Suzuki, Minoru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera controls for coupled and non-coupled objectives. 3,747,485, Cl. 95-10.0ct.

Suzuki, Shigeo: *See*—
Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 3,748,202.

Svenska Dataregister A.B.: *See*—
Englund, Gosta R.; and Myren, Rune L., 3,748,483.

Sverdlik, Naum Borisovich: *See*—
Taburinsky, Grigory Semenovich; Kholodenko, Petr Iosifovich; Lisitsyn, Konstantin Mikhailovich; Kinyaev, Boris Alexeevich; Krichevsky, Lev Abramovich; Novozhilov, Nikolai Fedorovich; Sverdlik, Naum Borisovich; and Poplavsky, Vladislav Iosifovich, 3,747,665

Swaney, C. William, Jr., to Philco-Ford Corporation. Aluminum brazing. 3,747,199, Cl. 29-494.000.

SWD Co.: *See*—
Walker, Bert A., 3,747,252.

Swearingen, Judson S. Cryogenic process. 3,747,358, Cl. 62-12.000.

Sybron Corporation: *See*—
Heit, Allyn H.; and Williamson, James N., 3,748,238.

Sypula, Richard J.: *See*—
Babcock, David L.; and Sypula, Richard J., 3,748,485.

Syvakari, Pertti: *See*—
Nilsson, Jan; Syvakari, Pertti; and Westman, Erik, 3,747,383.

Szymanski, Chester D., to National Starch and Chemical Corporation. Food product containing a novel converting starch. 3,748,151, Cl. 99-144.000.

Szymanski, Earl Thaddeus: *See*—
Pearson, Whitney Lombard; Banford, John Alexander; and Szymanski, Earl Thaddeus, 3,748,209.

Szymanski, John. Carpet stretcher. 3,747,157, Cl. 16-5.000.

Taburinsky, Grigory Semenovich; Kholodenko, Petr Iosifovich; Lisitsyn, Konstantin Mikhailovich; Kinyaev, Boris Alexeevich; Krichevsky, Lev Abramovich; Novozhilov, Nikolai Fedorovich; Sverdlik, Naum Borisovich; and Poplavsky, Vladislav Iosifovich. Sand-blowng machine. 3,747,665, Cl. 164-200.000.

Taguchi, Mitsuru: *See*—
Onoda, Michio; Usui, Saburo; Simizume, Tutomu; and Taguchi, Mitsuru, 3,747,346.

Tajima, Akira; and Momiyama, Kikuo, to Canon Kabushiki Kaisha. Reverse telephoto lens for near-distance photography. 3,748,021, Cl. 350-214.000.

Tajima, Akira, to Canon Kabushiki Kaisha. Reverse telephoto type lens prevented from the deterioraton of image at the time of close shot. 3,748,022, Cl. 350-214.000.

Takegawa, Hiroyasu; and Seki, Shiro, to Toyodo Koki Kabushiki Kaisha. Feed control apparatus having a guaging device for a numerically controlled machine tool. 3,748,562, Cl. 318-572.000.

Takeuchi, Shigeo, to Takeuchi Tekko Kabushiki Kaisha. Car washing apparatus. 3,747,151, Cl. 15-21.00e.

Takeuchi Tekko Kabushiki Kaisha: *See*—
Takeuchi, Shigeo, 3,747,151.

Takigawa, Tomoshi: *See*—
Tanikoshi, Kinji; and Takigawa, Tomoshi, 3,747,487.

Tam, Ford. Multiple redundant power supply. 3,748,500, Cl. 307-297.000.

Tamny, Simon Z.: *See*—
Hastings, Donald R.; Scarbrough, Don R.; Tamny, Simon Z.; and Wilhelm, Frederick R., 3,747,850.

Tanaka, Atsushi; Sawada, Hideo; Toba, Hirotaka; Kuumoto, Mashahiko; and Sato, Kozi, to Daicel Ltd. Process for polymerizing isobuthylene oxide. 3,748,286, Cl. 260-2.00a.

Tanaka, Mamoru: *See*—
Inoue, Gentei; Sato, Chuichi; and Tanaka, Mamoru, 3,747,470.

Tanges, John H., Jr., to Florida General Electronics, Inc. Insulated electrical connector. 3,748,632, Cl. 339-296.00r.

Tanguy, Christian, to Societe Anonyme D.B.A. Vehicle hydraulic braking system. 3,747,990, Cl. 303-21.0af.

Tanikoshi, Kinji; and Takigawa, Tomoshi, to Canon Kabushiki Kaisha. Exposure control system for a photographic system. 3,747,487, Cl. 95-10.0fd.

Tapp, Ernest Thomas James, to County Commercial Cars Limited. Power plant. 3,747,338, Cl. 60-69.000.

Tareau, Georges. Stay for brassiere cups. 3,747,606, Cl. 128-472.000.

Tarshis, Lemuel A.; Walker, James L.; and Berry, Thomas F., to General Electric Company. Superalloy eutectic braze. 3,748,107, Cl. 29-194.000.

Tarzian, Harry J. Hose clamp. 3,747,172, Cl. 24-282.000.

Tassie, Douglas P.: *See*—
Ashley, Eugene; and Tassie, Douglas P., 3,747,469.

Tate, David Arthur: *See*—
Agnew, James Malcolm; French, Albert Graham; and Tate, David Arthur, 3,747,982.

Tateo, Vito; and Galli, Guido, to Fabbrica Italiana Magneti Marelli S.p.A. Electronic position transducer for control members. 3,748,558, Cl. 318-341.000.

Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Geor-

gievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich. Root cleaner. 3,747,149, Cl. 15-3.110.

Taub, Stanley, to New York Medical College. Voice prosthesis. 3,747,127, Cl. 3-1.300.

Tauzin, Francis, to Pomagalski S. A. and Sigma Plastique. Convertible seat for cableways. 3,747,974, Cl. 297-184.000.

Taylor, Don A. Molding apparatus. 3,748,075, Cl. 425-251.000.

Taylor, Forest E.: *See*—
Fromlath, Joseph J.; and Taylor, Forest E., 3,747,707.

Taylor, Frank H., to Otis Engineering Corporation. Well tools. 3,747,682, Cl. 166-315.000.

Taylor, Kenneth I.: *See*—
Strobele, Caljon H.; Adams, James C., Jr.; Anderson, Wilfred King; Bargen,David W.; Eppstein, Anthony D.; Fletcher, Martin Wallace; Pearson, Willard C.; Taylor, Kenneth I.; and Youngstrom, Jerry R., 3,748,381.

Taylor, Lloyd D.: *See*—
Avtges, James A.; Reid, Jerome L.; Schlein, Herbert N.; and Taylor, Lloyd D., 3,748,129.

Taylor, Percey Ronald, to Monsanto Chemicals Limited. Production of moulds. 3,747,663, Cl. 164-25.000.

Taylor,Ward T. Hand exerciser. 3,747,593, Cl. 128-26.000.

Teitz, Peter David: *See*—
Strauss, Rudolf Siegfried; and Teitz, Peter David, 3,748,191.

Tektronix, Inc.: *See*—
Culter, Robert Gordon; Hayes, Raymond; and Sang, Emmanuel, 3,748,585.
Lind, Roger S., 3,747,173.

Teldec Telefunken-Decca Schallplatten GmbH: *See*—
Knothe, Herbert; Buck, Jurgen; Borchard, Heinz; and Rybka, Bruno, 3,747,390.

Telecommunications Corporation of America: *See*—
Yussen, Albert, 3,748,402.

Teledyne Mid-America Corporation: *See*—
Miller, James H.; and Darlington, Henry S., 3,747,751.

Teledyne Ryan Aeronautical: *See*—
Schaffner, Gerald, 3,748,499.

Telefonaktiebolaget L M Ericsson: *See*—
Krook, Otto Erik; and Nordblad, Sven Sigurd, 3,748,371.

Telex Computer Products, Inc.: *See*—
Wilson, John H., 3,747,867.

Tenkumo, Shohei; and Egawa, Takeshi, to Micro Mega S.A. Interchangeable lens type camera. 3,747,495, Cl. 95-53.0ea.

Tennant Company: *See*—
Carlson, Alfred D.; and Kasper, Joseph G., 3,747,156.

Tenneco Chemicals Inc.: *See*—
Winkler, Joseph; Bredbenner, Charles W.; and Adlum, Lawrence G., 3,748,288.

Tepper, Charles W., to United States of America, Navy, mesne. Window protector. 3,747,530, Cl. 102-70.20p.

Terada, Kenji: *See*—
Matsumoto, Mikio; Terada, Kenji; and Matsunaga, Mitsuru, 3,747,537.

Terai, Masaaki: *See*—
Matsuda, Ryoichi; Terai, Masaaki; and Hojyo, Yasuo, 3,748,399.

Tesoro, Giuliana C., to Stevens, J. P., & Co., Inc. Diether sulfones. 3,748,364, Cl. 260-607.00a.

Texaco Inc., mesne: *See*—
Wolf, Robert L.; and Cowlin, Christopher J., 3,747,339.

Texas Instruments, Incorporated: *See*—
Covault, Dennis O., 3,748,484.
Haisty, Robert W.; Johnson, Rowland E.; and Mehol, Edward W., 3,748,548.
Stone, Louis Earl; and Romano, Roberto, 3,747,562.
Ting, Voud H.; and Marcoux, Leo, 3,748,439.

Textron, Inc.: *See*—
Gray, Samuel A.; and Perello, Armando, 3,748,656.

Theimer, Ernst T.: *See*—
Grossman, James D.; Mookherjee, Braja D.; De Simone, Robert S.; and Theimer, Ernst T., 3,748,284.
Pittet, Alan O.; Mason, Michael E.; Theimer, Ernst T.; and Tibbetts, Merrick S., 3,748,145.

Thetford Corporation: *See*—
Sargent, Frank T.; and Andersen, James M., 3,747,130.

Theurer, Josef, to Plasser, Franz, Bahnbaumaschienen-Industrie-Gesellschaft m.b.H. Mobile track working machine. 3,747,536, Cl. 104-47.00r.

Thiokol Chemical Corporation: *See*—
Bertozzi, Eugene R., 3,748,314.
Bulbenko, George F.; Sorg, Ear H.; and Gallagher, John P., 3,748,313.
Vriesen, Calvin W.; and Merges, John C., Jr., 3,748,199.
Wommack, Walter C., 3,747,416.

Thomann, Helmut: *See*—
Cobarg, Christian; Fenner, Erich; Guntersdorfer, Max; Heywang, Walter; Otto, Franz; Schofer, Rudolf; and Thomann, Helmut, 3,748,503.

Thomas & Betts Corporation: *See*—
Bawa, Jaspal S., 3,747,960.
Fortsch, William A., 3,747,164.

Thomas, David Michael, to International Standard Electric Corporation. Conference facilities for a TDM exchange. 3,748,394, Cl. 179-18.0bc.

Thomas, John L.: *See*—
Frank, Gilbert Haven; and Thomas, John L., 3,748,569.

Thomas, Joseph E.: *See*—
Gass, Edward W.; Hammond, Jack; Lorenzino, Paul; and Thomas, Joseph E., 3,748,446.

Thompson, Eldon K. Portable saw mill. 3,747,457, Cl. 83-471.200.

Thompson, Robert M., to Sun Research and Development Co. Alkyladamantane diamine. 3,748,359, Cl. 260-563.00p.

Thompson, William B.: *See*—
Jones, Rexford W.; and Thompson, William B., 3,748,134.

Thrasher, Howard G., to Litton Systems, Inc. Vibrator isolator assembly. 3,747,914, Cl. 207-136.000.

Thunder Scientific Corporation: *See*—
Bennewitz, Paul F., 3,748,625.

Tibbals, Donald H. Ballasted vehicle tire and self-sealing thixotropic ballast composition therefor. 3,747,660, Cl. 152-330.000.

Tibbetts, Merrick S.: *See*—
Pittet, Alan O.; Mason, Michael E.; Theimer, Ernst T.; and Tibbetts, Merrick S., 3,748,145.

Tiefenbacher, Eberhard: *See*—
Bruder, Werner; Grieb, Hubert; and Tiefenbacher, Eberhard, 3,747,334.

Tilles, Edward B.: *See*—
Nissen, Rudolf F.; and Tilles, Edward B., 3,747,410.

Tillie, W. Robertus J.; Carleton, James T.; and Putman, Richard E. J., to Westinghouse Electric Corporation. Control system for the predryer section of a paper machine. 3,748,224, Cl. 162-252.000.

Tine, Sebastian David, to Watts Regulator Company. Backflow preventer. 3,747,621, Cl. 137-218.000.

Ting, Voud H.; and Marcoux, Leo, to Texas Instruments, Incorporated. Heating apparatus. 3,748,439, Cl. 219-353.000.

Tinsley, John M.: *See*—
Malone, William T.; Holtmyer, Marlin D.; Tinsley, John M.; and Chatterji, Jiten, 3,748,266.

Tisdale, Glenn E., to Westinghouse Electric Corporation. Automatic registration of points in two separate images. 3,748,644, Cl. 340-149.00a.

Tjonpiangi, William E.: *See*—
Carcia, Leslie C.; Mc Neill, John D.; Papanastastou, Theodore A.; Howers, Norman K.; and Tjonpiangi, William E., 3,748,650.

Toba, Hirotaka: *See*—
Tanaka, Atsushi; Sawada, Hideo; Toba, Hirotaka; Kuumoto, Mashahiko; and Sato, Kozi, 3,748,286.

Tobey, Frederic Samuel, to Brady, W. H., Co. Web processing cartridges. 3,747,865, Cl. 242-55.530.

Tokai Togyo Co., Ltd.: *See*—
Kawamura, Tamotsu; Yamashita, Kazuo; Hattori, Keisuke; and Ito, Yoshinao, 3,748,175.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Ito, Akira, 3,748,113.

Tolbert, William N., Jr., to Koehring Company. Throttle notches for control valve spools. 3,747,642, Cl. 137-625.690.

Tolle, Glenn E.; and Marhofer, Edwin G., to Gulf Oil Corporation. Process for manufacturing urea-fatty substance inclusion compounds. 3,748,319, Cl. 260-96.500.

Toluca Industries Corporation: *See*—
Horlach, Heinz Eric, 3,748,099.

Tomei, Keichi: *See*—
Grubb, John J.; and Tomei, Keichi, 3,747,842.

Tompsett, David Elliott, to Bell Telephone Laboratories, Incorporated. Electric to fluidic transducer. 3,747,644, Cl. 137-825.000.

Tonking, Henry B., Jr., 1/2 each to International Paper Company and Stanley Works, The. Apparatus and method for handling large size corrugated paperboard panels. 3,747,481, Cl. 93-1.00r.

Torelli, John A., to Du Pont de Nemours, E. I., and Company. Process for preparing alkyd-acrylic graft copolymers. 3,748,293, Cl. 260-21.000.

Torrens, Christian, to Societe Industrielle Honeywell Bull. Endless type carrier with type fingers connected by an endless strip and interposed viscous damping blocks. 3,747,522, Cl. 101-111.000.

Torrey, Donald F.; and Mapelsden, George C., to General Electric Company. Rotary switch with particular feeder contact. 3,748,419, Cl. 200-155.00r.

Torrey, Edwin A.: *See*—
Macomber, Ray Marvin, 3,747,354.

Toyoda, Eiji; Ito, Shin; and Kubo, Seitoku, to Toyota Jidosha Kogyo Kabushiki Kaisha. Shift control system for automatic transmission. 3,747,438, Cl. 74-866.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Kikuchi, Makoto, 3,747,584.

Toyodo Koki Kabushiki Kaisha: *See*—
Takegawa, Hiroyasu; and Seki, Shiro, 3,748,562.

Toyoshima, Isao, to Murata Manufacturing Co., Ltd. Method of manufacturing an energy trapped type ceramic filter. 3,747,176, Cl. 29-25.350.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Morino, Hideki; and Watanabe, Katsunori, 3,748,417.
Toyoda, Eiji; Ito, Shin; and Kubo, Seitoku, 3,747,438.
Uozumi, Sumio; and Sakai, Ichio, 3,747,439.

T.P.I. Limited: *See*—
Duval, Bruce, 3,747,230.

Duval, Bruce, 3,747,231.
Transrail AB: *See—*
Nordstrom, Kjell Hlege; and Flinth, Rune Nils Allan, 3,747,715.
Trassinelli, Duccio, to Sormani S.p.A. Floor lamp. 3,748,463, Cl. 240-81.0bs.
Treirat, Eduard. Moisture responsive device. 3,747,399, Cl. 73-73.000.
Tri-State Oil Tool Industries, Inc.: *See—*
Murray, William Kirby, 3,747,674.
Trimble House Corporation: *See—*
Inman, Richard B., 3,747,883.
Trimmer, Robert Henry: *See—*
Gangwisch, William J.; Trimmer, Robert Henry; and Gross, William Franklin, Jr., 3,748,093.
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May, Robert E.; and Triplett, Benny L., 3,748,217.
Troster, Helmut: *See—*
Fuchs, Otto; and Troster, Helmut, 3,748,330.
Trotter, Peter H.: *See—*
Hazzard, Robert D.; Trotter, Peter H.; Schlein, Kai Frederik; and Clute, Angelo, 3,748,011.
Troy, Amedee Roy; and Geyman, James M. Dry lubricated materials, members and systems with boron nitride and graphite. 3,747,944, Cl. 277-96.000.
Truck-Lite Co. Inc.: *See—*
Morrison, Charles R.; Sage, Howard A.; and Roberts, Edward R., 3,748,458.
Truth Incorporated: *See—*
Martin, Jerry L., 3,747,272.
TRW Inc.: *See—*
Burns, Eugene A.; and Jones, Robert J., 3,748,307.
Burns, Eugene A.; and Jones, Robert J., 3,748,310.
Burns, Eugene A.; and Jones, Robert J., 3,748,311.
Burns, Eugene A.; and Jones, Robert J., 3,748,312.
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Tsubakimoto Chain Mfg. Co., Ltd., The: *See—*
Matsumoto, Mikio; Terada, Kenji; and Matsunaga, Mitsuru, 3,747,537.
Tsujimoto, Kazumi N., to Airco, Inc. Electron beam heating system. 3,748,365, Cl. 13-31.000.
Tsuruzawa, Teruya, to Nippon Seal Co., Ltd. Cleaning brush with dust removing and collecting means. 3,747,152, Cl. 15-22.00c.
Tuan, Pao-Hwa. Three-dimensional tick-tack-toe. 3,747,931, Cl. 273-130.00a.
Tubbs, Eldred F., to Mudd, Harvey, College. Optical bench. 3,747,890, Cl. 248-166.000.
Tupone, Henry. Animated time piece. 3,747,330, Cl. 58-125.00r.
Turetsky, Veniamin Efimovich: *See—*
Berkovsky, Alexandr Mikhailovich; Turetsky, Veniamin Efimovich; Kulakov, Vladimir Petrovich; and Vakhrameev, Leonid Alexandrovich, 3,748,530.
Turko, Michael; and Seymour, Lynn L., to American Hospital Supply Corporation. Fume hood. 3,747,504, Cl. 98-115.0lh.
Turko, Michael, to American Hospital Supply Corporation. Air flow system for fume hood. 3,747,505, Cl. 98-115.0lh.
Uchiyama, Hideaki, to Kabushiki Kaisha Suwa Seikosha. Watch dial structure incorporating electrical devices. 3,747,327, Cl. 58-23.00r.
Uemura, Saburo; and Yanagisawa, Yuzuru, to Sony Corporation. Gaseous glow indicator tube formed on a substrate with a plurality of insulating layers. 3,747,175, Cl. 29-25.170.
Ueno, Hiroshi: *See—*
Mizutani, Norio; Sasaki, Ichiro; Ito, Takamitsu; Ueno, Hiroshi; Nishizaki, Shoichi; and Ishizuka, Tetsuo, 3,748,324.
Uetrecht, Dale M.: *See—*
Munch, Walter, Jr.; Wagner, William S.; and Uetrecht, Dale M., 3,748,598.
Uhlenhaut, Rudolf E.; Van Winsen, Friedrich H.; and Limmer, Hans, to Damiler-Benz Aktiengesellschaft. Safety shifting lever for the transmission of motor vehicles. 3,747,431, Cl. 74-524.000.
Ulm, Reign C.; and Kinghorn, Mark D., to Aerojet-General Corporation, mesne. Method of removal deformations from storage tank roof. 3,747,381, Cl. 72-54.000.
Unarco Industries, Inc.: *See—*
Enochain, Samuel H., 3,747,954.
Under Sea Industries, Inc.: *See—*
Roberts, Robert E., 3,747,140.
Ung, Harry L. Exercise and amusement device for use in the water. 3,747,923, Cl. 272-1.00b.
Unican Security Systems, Ltd.: *See—*
Van Deudekom, Hendrik, 3,747,377.
Unifab Corporation: *See—*
De Smit, Phillip A., 3,747,567.
Union Carbide Corporation: *See—*
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United Aircraft Corporation: *See—*
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Universal Oil Products Company: *See—*
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McGregor, Eugene R., 3,747,975.
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Uozumi, Sumio; and Sakai, Ichio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for automatic transmissions. 3,747,439, Cl. 74-869.000.
Upatnieks, Juris; and Mohan, Philip V., to General Motors Corporation. Method of detecting changes of a specular surface. 3,748,048, Cl. 356-212.000.
Upjohn Company, The: *See—*
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Urch, Harvey M.: *See—*
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Urig, Elmer R. Wet-end disposition of latices on fibers. 3,748,223, Cl. 162-169.000.
Uroshevich, Miroslav, to Alpha Designs, Inc. Portable dispensing containers. 3,747,802, Cl. 221-63.000.
U.S. Philips Corporation: *See—*
Beale, Julian Robert Anthony, 3,748,545.
Blasse, George; and De Vries, Jaap, 3,748,516.
Boekhorst, Antonius; and Rietveld, Jan Joost, 3,748,531.
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Usymbal, Alexandr Gavrilovich: *See—*

Tatyanko, Nikolai Vasilievich; Usymbal, Alexandr Gavrilovich; Isikov, Sergei Alexandrovich; Sietsenko, Vladimir Vasilievich; Oleinik, Ivan Pavlovich; Betcher, Alexandr Samuilovich; Pasha, Leonid Georgievich; Ilge, Genrikh Karlovich; Sokulova, Maria Stepanona; Rusanov, Ivan Ivanovich; Gelmikh, Jury Dmitrievich; Khmel, Nikolai Dmitrievich; Kozhushko, Dmitry Ignatievich; and Beinisovich, Boris Anatolievich, 3,747,149.

Utriainen, Leino Yrjo: *See—*
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Valentino, Joseph V. Combined check and relief valve. 3,747,626, Cl. 137-102.000.

Valspar Corporation, The: *See—*
Pipkins, David D., 3,747,523.

Value Engineered Components, Inc.: *See—*
Ryder, Francis E., 3,747,657.

Van Bellen, Leo William: *See—*
Greenwood, Roger; and Van Bellen, Leo William, 3,747,623.

Van de Meerendonk, Gerardus C., to Nedschroef Octrooi Maatschappij N.V. Machine for manufacturing screw bolts and the like by means of a number of shaping stations. 3,747,144, Cl. 10-12.00r.

van der Hilst, Jan; Koorneef, Jacob; and Rietdijk, Johan Adriaan, to U.S. Philips Corporation. Apparatus for recording and/or playing back magnetic recordings on or/from a flexible, in particular tape-shaped, record carrier. 3,747,938, Cl. 274-4.00r.

van der Lely, Fiet, to U.S. Philips Corporation. Tape recording and/or play-back apparatus. 3,747,941, Cl. 274-4.00e.

Van Deudekom, Hendrik, to Unican Security Systems, Ltd. Door locking means. 3,747,377, Cl. 70-149.000.

Van Gessel, Robert C.: *See—*
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van Putten, James D., Jr., to Donelly Mirrors, Inc. Day-night mirror. 3,748,025, Cl. 350-280.000.

Van Slooten, Marion; and Kass, John C., said Van Slooten assor. of 100%, and said Kass assor. of 50% to Van's Pines, Inc. Packaging method and apparatus. 3,747,293, Cl. 53-24.000.

Van Wicklin, Warren A., Jr.: *See—*
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Van Winsen, Friedrich H.: *See—*
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Vancini, Carlo A.: *See—*
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Varholy, Edward: *See—*
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Varian Associates: *See—*
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Vartanian, George: *See—*
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Vayda, Adam V.: *See—*
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Vdoviak, John William; and Dusa, Donald John, to General Electric Company. Propulsion nozzles. 3,747,855, Cl. 239-265.290.

VEB Ingenieurburo Schiffbau: *See—*
Schroll, Josef; and Sroke, Werner, 3,747,668.

VEB Polygrafischer Maschinenbau Leipzig, mesne: *See—*
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Velsicol Chemical Corporation: *See—*
Richter, Sidney B.; and Stach, Leonard J., 3,748,335.

Venker, Hilrich Jan Matthijs, to Societe Industrielle Honeywell Bull (Societe Anonyme). Print device for a printer. 3,748,613, Cl. 335-268.000.

Venus Electronics Corporation: *See—*
Glover, Boyd W.; and Rainey, Harold N., 3,747,301.

Vereinigte Osterreichische Eisen- und Stahlwerk Aktiengesellschaft: *See—*
Schoffmann, Rudolf, 3,747,664.

Versari, Werner Rio; and Kirstein, Lothar, to Schneider, Jos., & Co. Optische Werke. Servo valve. 3,747,570, Cl. 137-625.640.

Versluis, Rueland; Schinkelsh, Jacob; and Schuurman, Peter J., to Shell Oil Company. Gas treating apparatus. 3,747,308, Cl. 55-387.000.

Verwey, William: *See—*
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Vettel, Norbert: *See—*
Hugoson, Birger O.; and Vettel, Norbert, 3,748,060.

Viccaro, John P., to Lever Brothers Company. Alkaline protease, method for its production, and detergent composition. 3,748,233, Cl. 195-66.00r.

Victory, Thomas J. Brake band end connection and method of manufacture. 3,747,713, Cl. 188-259.000.

Vieweg, Gunther: *See—*
Klein, Gerald; and Vieweg, Gunther, 3,747,998.

Vigini, Giorgio, to Honeywell Information Systems Italia. Protection device for hammer driving circuits. 3,748,537, Cl. 317-31.000.

Vilagi, Burton J.: *See—*
Nord, Eric T.; Rosen, Samuel R.; Scarbrough, Don R.; Vilagi, Burton J.; and Runstadler, Peter W., Jr., 3,747,852.

Viland, Clare Kenneth. Preventing air pollution and improving safety of automobile and similar tanks. 3,747,800, Cl. 220-85.00b.

Visioli, Armando Joseph, Jr.; and Wittlinger, Harold Allen, to RCA Corporation. Illumination activated transistor relaxation oscillator. 3,748,591, Cl. 331-66.000.

Vitcusky, William Paul: *See—*
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VLN Corporation: *See—*
Ciolli, Donald A., 3,747,719.

Vogel, Charles B., to Shell Oil Company. Electrical logging system for use with a drill string. 3,748,573, Cl. 324-10.000.

Vogel, Eberhard: *See—*
Stroezel, Reinhold; Vogel, Eberhard; Hettich, Alfred; Bartholoma, Karl; Hahner, Reinhard; and Lederer, Hans, 3,747,280.

Vogiatzis, John P.: *See—*
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Volkswagenwerk Aktiengesellschaft: *See—*
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Von Nordenskjold, Reinhard, to Dietzel, Georg, Firma. Process for drying raw agricultural products, particularly potatoes. 3,747,224, Cl. 34-12.000.

Voorhees, Alan M., mesne: *See—*
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Vorbruggen, Helmut, to Schering A.G. Process for the preparation of pyrimidine nucleosides. 3,748,320, Cl. 260-211.50r.

Vriesen, Calvin W.; and Merges, John C., Jr., to Thiokol Chemical Corporation. Composite propellants containing hydroxylammonium perchlorate. 3,748,199, Cl. 149-19.000.

Vuffray, Georges C., to Girard-Perregaux S.A. Electric motor for watches. 3,747,320, Cl. 58-23.00d.

Vyxoka skola banska: *See—*
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Wacker, George A.; and Danek, George J., Jr. Seal-off valve. 3,747,619, Cl. 137-80.000.

Wagener, Paul W., to Westinghouse Electric Corporation. Optically coupled solid state relay. 3,748,481, Cl. 250-214.00r.

Wagner, John G., to National Cash Register Company, The, mesne. Process of forming minute capsules. 3,748,277, Cl. 252-316.000.

Wagner, William A.; and Newman, James W., to Windings, Inc. Apparatus and method for winding flexible material for twistless payout through a straight radial opening. 3,747,861, Cl. 242-18.00r.

Wagner, William S.: *See—*
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Waid, John M., to Shell Oil Company. Consolidating reservoir formation sand with underdisplaced resin. 3,747,678, Cl. 166-295.000.

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Walker, Bert A., to SWD Co. Musket ball insertion tool. 3,747,252, Cl. 42-90.000.

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Wallen, Bjorn Valter. Elastic sole insert for horse shoes. 3,747,684, Cl. 168-28.000.

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Wallman, Irwin, to Consolidated Airborne Systems, Inc. Probe mounted electronics for fuel gage system. 3,747,407, Cl. 73-304.00c.

Walter, Homer E.; and Sadler, Arthur M. Continuous production of cheese curd. 3,748,149, Cl. 99-116.000.

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Walters, Arley: *See—*
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Waner, Donald W.; and Olsen, Roger F., to North American Rockwell Corporation. Motion transmitting assembly. 3,747,428, Cl. 74-496.000.
Wang, Han-Chiu, to Bell Telephone Laboratories, Incorporated. Tunable mocrowave bandstop resonant cavity apparatus. 3,748,604, Cl. 333-73.00w.
Wanzenberg, Frederick W.; and Wanzenberg, Fritz W. Deep sea mining system. 3,748,248, Cl. 204-208.000.
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Ware, Colin C. Silencer. 3,747,704, Cl. 181-44.000.
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Waroblak, Michael Theodore, to Du Pont de Nemours, E. I., and Company. Dopes of poly(p-phenylene terephthalamide) in organophosporus solvents. 3,748,299, Cl. 260-32.6na.
Warren, Henry Ray, to RCA Corporation. Tracking control for recorder-reproducer systems with the control transducer located at the neutral point of the tape stretch. 3,748,408, Cl. 179-100.20t.
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Wechter, Allen. Window switch assemblies for burglar alarm. 3,748,416, Cl. 200-61.740.
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Weiss, Heinz, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Hydrostatic transmission. 3,747,349, Cl. 60-421.000.
Weisstuch, Aaron, to Betz Laboratories, Inc. Corrosion probe assembly. 3,748,247, Cl. 204-195.00c.
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Wenz, Adolf; Neisius, Karlheinz; and Litters, Alois, to Merck Patent Gesellschaft mit beschrankter Haftung. Desiccants with moisture indicator. 3,748,272, Cl. 252-194.000.
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West, Donald J.; and Martin, William J., II, to Sperry Rand Corporation. Power transmission. 3,747,350, Cl. 60-459.000.
West, William A., to Du Pont de Nemours, E. I., and Company. Light stable quinacridonequinone yellow pigment. 3,748,162, Cl. 106-288.00q.
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Whelan, Edmond Kerran, to National Dairy Association of New Zealand Limited, The. Apparatus for compacting curd in the process of manufacturing cheese. 3,748,072, Cl. 425-85.000.
Whelan, Edmund Kerran, to National Dairy Association of New Zealand, Limited, The. Apparatus for cutting compacted curd into pieces. 3,748,076, Cl. 425-311.000.
White, Dwain M.; and Klopfer, Howard J., to General Electric Company. Copolymers of acetylenes and phenols. 3,748,305, Cl. 260-47.0ua.
White, Eugene B., to Filters International, Inc. Reverse flow aquarium filter device. 3,747,762, Cl. 210-169.000.
White, James Carlton, Jr. Bar lock linkage. 3,747,376, Cl. 70-18.000.
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Willems, Josef Frans, to Agfa-Gevaert N.V. Photographic silver bleaching solution. 3,748,136, Cl. 96-60.00r.

Williams, Burton M., to Fibreboard Corporation. Remote starting control circuit for welder power supply. 3,748,561, Cl. 318-484.000.

Williams, George E.; and Larsen, Olaf E., to Phillips Petroleum Company. Apparatus for producing pipe having a bend. 3,748,077, Cl. 425-317.000.

Williams, Jack L. R.: *See*—
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Williams, John T., Sr. Air pollution control system. 3,747,502, Cl. 98-43.000.

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Willinger, Allan H., to Metaframe Corporation. Fish net. 3,747,250, Cl. 43-11.000.

Willis, Thomas Edward, to Du Pont de Nemours, E. I., and Company. Guide device for separating yarn ends. 3,747,317, Cl. 57-106.000.

Willson, James R.; and Carey, Donald W., to Robertshaw Controls Company. Method for stabilizing and employing temperature sensitive materials exhibiting martensitic transitions. 3,748,197, Cl. 148-131.000.

Wilowski, Theodore. Traction device. 3,747,237, Cl. 36-59.00c.

Wilson, Alexander John, to Girling Limited. Platform for pit weighing device. 3,747,716, Cl. 177-134.000.

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Wilson, Francis B.; and Rodenkirch, Mathew E., to Singer Company, The. Predictive position feedback controller for web guide control system. 3,748,565, Cl. 318-609.000.

Wilson, Frank. Protective pads. 3,747,654, Cl. 150-1.50r.

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Winkler, Gustav A., to Motorola, Inc. Tape cartridge ejection mechanism. 3,747,940, Cl. 274-4.00b.

Winkler, Joseph; Bredbenner, Charles W.; and Adlum, Lawrence G., to Tenneco Chemicals Inc. Process for preparing substantially nonlustrous open pore polyurethane foams in situ and foam prepared thereby. 3,748,288, Cl. 260-2.5ah.

Winkler, Klaus, to Siemens Aktiengesellschaft. System for scanning the loop-warning barriers of pneumatic buffer chambers in magnetic tape units. 3,747,818, Cl. 226-1.000.

Winkler, Robert J., to Long Mile Rubber Company. Wrist alarm for children. 3,747,328, Cl. 58-57.500.

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Witherspoon, Romeo R., to General Motors Corporation. Process of preparing manganese oxide catalyzed cathodes. 3,748,184, Cl. 136-122.000.

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Woida, Arthur F. Tool and workpiece holder. 3,747,278, Cl. 51-45.000.

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Woolley, Lee A., to Scott & Fetzer Company, The. Motor constructions including a sliding stop member. 3,748,508, Cl. 310-41.000.

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Worth, Joseph H.; Miller, Howard A.; and Glover, Clyde P., to Eastman Kodak Company. Photosensitive and thermosensitive elements and process for development. 3,748,137, Cl. 96-67.000.

Wright, George C.; Kozel, Charles; Baraglis, Nathan; and Marciszewski, Ed, to Methode Manufacturing Corporation. Environmentally controlled video tube assembly. 3,748,521, Cl. 313-325.000.

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Yamamura, Katsumi; Kakizawa, Kouji; and Yamazaki, Yoshio, to Kabushiki Kaisha Suwa Seikosha. Electrodes for liquid crystal display device. 3,748,017, Cl. 350-160.01c.

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Youngblood, Donald A., to Elco Corporation, mesne. Projector and cartridge for combination visual and sound apparatus. 3,748,031, Cl. 353-15.000.
Youngman, Phillip Robert Vasar. Computing apparatus. 3,747,844, Cl. 235-68.000.
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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Appel, Arthur, J. E. Harry, and A. J. Stein, to International Business Machines Corp. Method and system for generating shaded pictures. T912,012, 7–24–73, Cl. 444—1.

Beach, David E., and J. R. Stoneham. Camera. T912,017, 7–24–73, Cl. 95—31.

Beeler, Albert D.: *See*—
Foster, Lloyd P., Beeler, and Valentine. T912,016.

Foster, Lloyd P., A. D. Beeler, and D. L. Valentine. Adhesive polymeric compositions. T912,016, 7–24–73, Cl. 252—186.

Harpham, John A., and E. D. Klug, to Hercules Inc. Smoking product. T912,011, 7–24–73, Cl. 131—2.

Harry, Joseph E.: *See*—
Appel, Arthur, Harry, and Stein. T912,012.

Hercules Inc.: *See*—
Harpham, John A., and Klug. T912,011.

Holsinger, William P., to United States of Ameria, Department of Health, Education, and Welfare. Finger tip egg monitor utilizing injection for AGC. T912,010, 7–24–73, Cl. 128—2.

International Business Machines Corp.: *See*—
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Liniger, Werner, and Odeh. T912,013.

Jeandot, Dominique.: *See*—
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Kendrick, Lucian A. Production of suspension fertilizers from wet-process orthophosphoric acids. T912,015, 7–24–73, Cl. 71—34.

Klug, Eugene D.: *See*—
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Liniger, Werner, and F. M. Odeh, to International Business Machines Corp. Highly accurate unconditionally stable method for integrating ordinary differential equations. T912,013, 7–24–73, Cl. 444—1.

Maskornick, Michael J. Process for preparing a bonded article and product thereof. T912,018, 7–24–73, Cl. 156—333.

Meline, Robert S.: *See*—
Shirley, Arthur R., Jr., and Meline. T912,014.

Odeh, Farouk M.: *See*—
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Shirley, Arthur R., Jr., and R. S. Meline. Coating processes. T912,014, 7–24–73, Cl. 117—100.

Stein, Arthur J.: *See*—
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Stoneham, Jeffrey R.: *See*—
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LIST OF REISSUE PATENTEES

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Carson, Raymond R. Machine for gathering, stacking and transporting hay. Re. 27,706, 7–24–73, Cl. 56—350.

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186 3,747,547
252 3,747,548

CLASS 114

39 3,747,549
3,747,550
79W 3,747,551
206R 3,747,552
208A 3,747,553
218 3,747,554

CLASS 115

18 3,747,555
35 3,747,556

CLASS 116

70 3,747,557

CLASS 117

47A 3,748,166
72 3,748,167
3,748,168
106A 3,748,169
129 3,748,170
3,748,171
135.1 3,748,172
136 3,748,173
217 3,748,174

CLASS 118

8 3,747,558
48 3,747,559
57 3,747,560
259 3,747,561
415 3,747,562

CLASS 119

1 3,747,563
3,747,564
3,747,565
5 3,747,566
17 3,747,567
44 3,747,568
96 3,747,569

CLASS 122

235R 3,747,571
511 3,747,572

CLASS 123

8.05 3,747,573
21 3,747,574
32EA 3,747,575
3,747,576
3,747,577
42 3,747,578
90.3 3,747,579
140J 3,747,580
141 3,747,581
148A 3,747,583
148E Re.27,704
3,747,582

CLASS 125

11CD 3,747,584

CLASS 126

92R 3,747,585
110B 3,747,586
343.5R 3,747,587
360A 3,747,588

CLASS 127

60 3,748,175

CLASS 128

2N 3,747,589
2.06E 3,747,590
17 3,747,591
26 3,747,593
49 3,747,594
66 3,747,595
132D Re.27,710
134 3,747,596
140N 3,747,597
142 3,747,598
142.7 3,747,599
188 3,747,600
284 3,747,601
287 3,747,602
341 3,747,603
419D 3,747,605
419P 3,747,604
472 3,747,606

CLASS 131

140B 3,747,607
141 3,747,608
240R 3,747,609

CLASS 132

9 3,747,610
91 3,747,611
92R 3,747,612

CLASS 133

1 3,747,613

CLASS 134

2 3,748,176
30 3,748,177
109 3,747,614

CLASS 135

20R 3,747,615

CLASS 136

6F 3,748,178
86B 3,748,180
86R 3,748,179
107 3,748,181
111 3,748,182
114 3,748,183
122 3,748,184
173 3,748,185
175 3,748,186

CLASS 137

38 3,747,616
66 3,747,617
80 3,747,618
3,747,619
100 3,747,624
102 3,747,625
3,747,626
3,747,627
119 3,747,620
218 3,747,621
262 3,747,622
289 3,747,623
3,747,628
270 3,747,629
312 3,747,630
318 3,747,631
375 3,747,632
487.5 3,747,634
489.3 3,747,633
539.5 3,747,635
561 3,747,636
594 3,747,637
625.21 3,747,640
625.24 3,747,639
625.4 3,747,638
625.41 3,747,641
625.64 3,747,570
625.69 3,747,642
806 3,747,643
825 3,747,644
838 3,747,645

CLASS 138

148 3,747,646

CLASS 139

59 3,747,647

CLASS 140

147 3,747,648

CLASS 144

1E 3,747,650
1S 3,747,910
34A 3,747,651

CLASS 145

31R 3,747,652

CLASS 148

1.5 3,748,187
2 3,748,188
3 3,748,189
6.2 3,748,190
12.7 3,748,194
16.5 3,748,195
23 3,748,191
32.5 3,748,192
101 3,748,193
131 3,748,196
3,748,197
188 3,748,198

CLASS 149

19 3,748,199
30 3,748,200
109 3,748,201

CLASS 150

1 3,747,653
1.5R 3,747,654
52R 3,747,655

CLASS 151

21B 3,747,656
41.7 3,747,657

CLASS 152

97 3,747,658
210 3,747,659
330 3,747,660

CLASS 156

59 3,748,202
175 3,748,203
244 3,748,204
252 3,748,205
327 3,748,206
359 3,748,207
443 3,748,208
510 3,748,209
567 3,748,210
575 3,748,211

CLASS 157

1.17 3,747,661

CLASS 160

1 3,747,662

CLASS 161

36 3,748,212
68 3,748,213
122 3,748,214
139 3,748,215
148 3,748,216
159 3,748,217
253 3,748,218

CLASS 162

61 3,748,219
72 3,748,220
164 3,748,221
165 3,748,222
169 3,748,223
252 3,748,224
272 3,748,225

CLASS 164

25 3,747,663
76 3,747,664
200 3,747,665
279 3,747,666
282 3,747,667
287 3,747,668
348 3,747,669

CLASS 165

1 3,747,670
26 3,747,671
47 3,747,672
67 3,747,673

CLASS 166

98 3,747,674
237 3,747,675
275 3,747,676
293 3,747,677
295 3,747,678
299 3,747,679
305R 3,747,680
307 3,747,681
315 3,747,682

CLASS 168

25 3,747,683
28 3,747,684

CLASS 169

26 3,747,685

CLASS 172

20 3,747,686
40 3,747,687
149 3,747,688

CLASS 173

90 3,747,689
118 3,747,690
119 3,747,691
122 3,747,692
128 3,747,693
137 3,747,694
151 3,747,695

CLASS 174

12BH 3,748,368
36 3,748,369
42 3,748,370
70R 3,748,371
102R 3,748,372
115 3,748,373

CLASS 175

87 3,747,696
88 3,747,697
92 3,747,698
323 3,747,700
3,747,701
329 3,747,699

CLASS 176

3 3,748,226
38 3,748,227
60 3,748,228
65 3,748,229
78 3,748,230

CLASS 177

134 3,747,715
3,747,716

CLASS 178

5.4CD 3,748,376
5.4F 3,748,375
5.4R 3,748,377
3,748,378
6 3,748,379
6.6A 3,748,381
6.8 3,748,374
3,748,380
7.1 3,748,382
7.2 3,748,383
3,748,384
67 3,748,385
69.5DC 3,748,386
112 3,748,387

CLASS 179

2C 3,748,397
5R 3,748,388
3,748,389
7MM 3,748,392
15AF 3,748,393
18BC 3,748,394
18DA 3,748,396
18FA 3,748,395
18GE 3,748,390
41A 3,748,398
81A 3,748,399
81B 3,748,400
84R 3,748,391
3,748,401
90D 3,748,402
99 3,748,403
3,748,404
3,748,405
100.2CA 3,748,406
3,748,407
100.2T 3,748,408
149 3,748,409
167 3,748,410
170A 3,748,411

CLASS 180

6.5 3,747,717
9.2R 3,747,718
33B 3,747,721
33R 3,747,720
66R 3,747,722
75 3,747,724
77S 3,747,723
79.2R 3,747,725
129 3,747,726

CLASS 181

.5AP 3,747,703
15.5BE 3,747,702
44 3,747,704

CLASS 182

113 3,747,706
129 3,747,707
152 3,747,708
219 3,747,709

CLASS 187

29R 3,747,710

CLASS 188

71.9 3,747,711
73.2 3,747,712
181A 3,747,705
259 3,747,713
317. 3,747,714

CLASS 192

18A 3,747,727
58A 3,747,728
70.28 3,747,729
87.11 3,747,730
104R 3,747,731

CLASS 194

1M 3,747,732
10 3,747,733

CLASS 195

28N 3,748,232
28R 3,748,231
66R 3,748,233

CLASS 197

181 3,747,734
186B 3,747,735

CLASS 198

25 3,747,736
31AA 3,747,737
33AA 3,747,738
34 3,747,739
76 3,747,781
209 3,747,740
219 3,747,741
221 3,747,742

CLASS 200

46 3,748,412
61.08 3,748,413
61.13 3,748,414
61.45M 3,748,415
61.74 3,748,416
61.91 3,748,417
82B 3,748,418
155R 3,748,419
168R 3,748,420

CLASS 202

187 3,748,234
227 3,748,235

CLASS 203

8 3,747,988

CLASS 204

49 3,748,236
55R 3,748,237
92 3,748,238
129.4 3,748,239
149 3,748,240
158R 3,748,242
159.12 3,748,241
163R 3,748,243
180R 3,748,244
192 3,748,246
195C 3,748,247
195P 3,748,245
208 3,748,248
214 3,748,249
266 3,748,250
284 3,748,252
298 3,748,253

CLASS 206

46R 3,747,743
47R 3,747,744
52R 3,747,745
52W 3,747,746
56DF 3,747,747
58 3,747,748
65A 3,747,751
65C Re.27,705
3,747,749
65S 3,747,750

CLASS 207

136 3,747,914

CLASS 208

8 3,748,254
65 3,748,255
3,748,256
74 3,748,251
111 3,748,257
138 3,748,258
3,748,259
139 3,748,260
210 3,748,261

CLASS 209

71 3,747,752
73 3,747,753
80.5 3,747,754
111.5 3,747,755
123 3,747,756
164 3,747,757

CLASS 210

63 3,748,262
65 3,748,263
3,748,264
66 3,747,758
73 3,747,759
84 3,747,760
120 3,747,761
169 3,747,762
181 3,747,763
189 3,747,764
238 3,747,765
259 3,747,766
282 3,747,767
288 3,747,768
350 3,747,769
402 3,747,770
409 3,747,771
493 3,747,772
495 3,747,773

CLASS 211

37 3,747,774
43 3,747,775
88 3,747,776
176 3,747,777

CLASS 214

1A 3,747,778
3,747,779
10.5R 3,747,780
75T 3,747,782
86A 3,747,783
152 3,747,784
302 3,747,785
309 3,747,786
390 3,747,787
512 3,747,788
671 3,747,789
730 3,747,790

CLASS 215

11R 3,747,791
40 3,747,792
42 3,747,793

CLASS 217

15 3,747,794

CLASS 219

10.53 3,748,422
10.55 3,748,421
3,748,423
3,748,424
10.69 3,748,425
60A 3,748,426
69M 3,748,428
69P Re.27,707
69S 3,748,427
73 3,748,429
97 3,748,430
3,748,431
121EB 3,748,432
125R 3,748,433
130 3,748,435
146 3,748,434
211 3,748,436
214 3,748,437
271 3,748,438
353 3,748,439

CLASS 220

3 3,747,795
29 3,747,796
53 3,747,797
55Y 3,747,798
69 3,747,799
85B 3,747,800
113 3,747,801

CLASS 221

63 3,747,802
251 3,747,803

CLASS 222

1 3,747,804
82 3,747,805
102 3,747,806
153 3,747,807
166 3,747,808
183 3,747,809
199 3,747,810
233 3,747,811
387 3,747,812
541 3,747,813

CLASS 224

42.12 3,747,814
45S 3,747,815

CLASS 225

11 3,747,816
97 3,747,817

CLASS 226

1 3,747,818
25 3,747,819
76 3,747,820
104 3,747,821
162 3,747,822

CLASS 227

3 3,747,824
90 3,747,825
99 3,747,823
3,747,826
100 3,747,827
112 3,747,828

CLASS 228
29 3,747,829

CLASS 229
17 3,747,833
20 3,747,834
21 3,747,830
27 3,747,831
31R 3,747,832
40 3,747,835
42 3,747,836
73 3,747,837

CLASS 232
4R 3,747,838
35 3,747,839

CLASS 233
20R 3,747,840
24 3,747,841
26 3,747,842
32 3,747,843

CLASS 235
61.11D 3,748,442
61.5R 3,748,440
61.6R 3,748,441
68 3,747,844
78 3,747,845
84 3,747,846
85 3,747,847
92CT 3,748,444
92TC 3,748,443
92C 3,748,445
94R 3,747,848
151.12 3,748,448
151.35 3,748,446
152 3,748,447
3,748,449
155 3,748,450
156 3,748,451
168 3,748,452
194 3,748,453
200WB 3,748,454

CLASS 236
91 3,747,849

CLASS 239
3 3,747,850
8 3,747,851
3,747,852
90 3,747,857
99 3,747,858
187 3,747,853
227 3,747,854
265.29 3,747,855
418 3,747,859
428.5 3,747,856
431 3,747,860

CLASS 240
2AT 3,748,455
2.1 3,748,456
6.4F 3,748,457
41.55 3,748,458
46.19 3,748,459
51.11R 3,748,460
3,748,461
57 3,748,462
81BS 3,748,463
108R 3,748,464
147 3,748,465

CLASS 242
18R 3,747,861
35.6R 3,747,862
47.01 3,747,864
47.08 3,747,863
55.53 3,747,865
58.6 3,747,866
68.3 3,747,867
72 3,747,868
82 3,747,869
137.1 3,747,870
181 3,747,871
206 3,747,872

CLASS 244
3 3,747,873
53R 3,747,875
53 3,747,874
83D 3,747,876
139 3,747,877

CLASS 246
63C 3,748,466

CLASS 248
9 3,747,878
3,747,879
42 3,747,881
96 3,747,882
181 3,747,884
187 3,747,883
188.1 3,747,885
325 3,747,886
361R 3,747,880
3,747,887
373 3,747,888
451 3,747,889
466 3,747,890
475R 3,747,891

CLASS 250
207 3,748,478
208 3,748,479
211J 3,748,480
214R 3,748,481
219DF 3,748,482
219D 3,748,483
225 3,748,484
226 3,748,485
231R 3,748,486
259 3,748,474
311 3,748,467
3,748,468
333 3,748,471
363 3,748,470
371 3,748,472
388 3,748,476
392 3,748,473
459 3,748,469
502 3,748,475
512 3,748,487

CLASS 251
65 3,747,892
148 3,747,893
215 3,747,894

CLASS 252
1 3,748,265
8.55R 3,748,266
46.6 3,748,269
62.56 3,748,270
62.57 3,748,271
89 3,748,267
90 3,748,268
194 3,748,272
301.1S 3,748,273
3,748,274
312 3,748,275
316 3,748,276
3,748,277
319 3,748,278
429B 3,748,279
430 3,748,280
441 3,748,281
455R 3,748,283
471 3,748,282
522 3,748,284
531 3,748,285

CLASS 254
10.5 3,747,895
150 3,747,896

CLASS 256
10 3,747,897
59 3,747,898

CLASS 259
9 3,747,899
57 3,747,900

CLASS 260
2A 3,748,286
2.5AH 3,748,288
2.5AY 3,748,287
2.5BF 3,748,289
2.5F 3,748,290
18PN 3,748,292
18TN 3,748,291
21 3,748,293
22TN 3,748,294
29.6TA 3,748,295
30.2R 3,748,338
31.8DR 3,748,297
32.6N 3,748,298
3,748,299
37R 3,748,317
38 3,748,300
41A 3,748,301
41B 3,748,302
47CP 3,748,304
47UA 3,748,305
47XA 3,748,303
49 3,748,306
72.5 3,748,307
75NT 3,748,315
75N 3,748,309
78.3R 3,748,308
78.4R 3,748,310
3,748,311
79 3,748,312
3,748,313
3,748,314
80.75 3,748,316
93.5A 3,748,318
96.5 3,748,319
211.5R 3,748,320
234R 3,748,324
239BB 3,748,321
239BF 3,748,322
239.1 3,748,323
240A 3,748,326
240E 3,748,325
243B 3,748,327
243C 3,748,328
244R 3,748,329
249.6 3,748,330
251QB 3,748,331
270R 3,748,332
286R 3,748,333
294.8K 3,748,335
295R 3,748,336
297R 3,748,334
299 3,748,337
308C 3,748,339
308R 3,748,296
326C 3,748,340
326.8 3,748,341
332.3P 3,748,342
332.5 3,748,343
340.2 3,748,345
340.7 3,748,344
348R 3,748,346
402 3,748,347
410.7 3,748,348
435R 3,748,349
467 3,748,351
475R 3,748,350
481R 3,748,352
512R 3,748,353
514G 3,748,354
534E 3,748,355
553E 3,748,356
554 3,748,357
562P 3,748,358
563P 3,748,359
564R 3,748,360
566AC 3,748,361
576 3,748,362
606.5P 3,748,363
607A 3,748,364

CLASS 261
1 3,747,901
27 3,747,903
30 3,747,902
92 3,747,904
114R 3,747,905
118 3,747,906
128 3,747,907

CLASS 266
1R 3,747,908
13 3,747,909
23M 3,747,911
34T 3,747,912

CLASS 267
64R 3,747,913
139 3,747,915

CLASS 269
322 3,747,916

CLASS 270
68R 3,747,917

CLASS 271
4 3,747,918
19 3,747,919
54 3,747,921
74 3,747,922
85 3,747,920

CLASS 272
1B 3,747,923
79R 3,747,924
83A 3,747,925

CLASS 273
33 3,747,927
98 3,747,928
3,747,929
113 3,747,930
130A 3,747,931
130B 3,747,926
131B 3,747,932
3,747,933
135E 3,747,934
138R 3,747,935
143R 3,747,936
153R 3,747,937

CLASS 274
4B 3,747,940
4E 3,747,941
4F 3,747,939
4R 3,747,938
47 3,747,942

CLASS 277
30 3,747,943
96 3,747,944

CLASS 279
1SJ 3,747,945
81 3,747,946

CLASS 280
11.13F 3,747,947
112R 3,747,948
124A 3,747,950
124F 3,747,949
150AB 3,747,952
3,747,953
3,748,477
150R 3,747,951
179R 3,747,954
204 3,747,955
206 3,747,956
404 3,747,957
477 3,747,958

CLASS 283
7 3,747,959

CLASS 285
39 3,747,960
133R 3,747,961
202 3,747,962
286 Re.27,709
336 3,747,963
337 3,747,964

CLASS 287
54C 3,747,965
119R 3,747,966

CLASS 292
104 3,747,967

CLASS 293
88 3,747,968
89 3,747,969

CLASS 294
81SF 3,747,970
82R 3,747,971
118 3,747,972

CLASS 297
84 3,747,973
184 3,747,974
191 3,747,975
361 3,747,976
440 3,748,012
445 3,747,977
3,747,978
451 3,747,979

CLASS 298
1V 3,747,980

CLASS 299
39 3,747,981
81 3,747,982

CLASS 300
21 3,747,983

CLASS 301
37P 3,747,984

CLASS 302
28 3,747,985
62 3,747,986

CLASS 303
7 3,747,987
21AF 3,747,990
21F 3,747,991
21P 3,747,989
40 3,747,992
68 3,747,993

CLASS 305
35EB 3,747,994
3,747,995
38 3,747,996

CLASS 307
18 3,748,488
87 3,748,489
117 3,748,492
141 3,748,490
149 3,748,491
232 3,748,493
235 3,748,494
237 3,748,495
252W 3,748,496
255 3,748,497
279 3,748,498
295 3,748,499
297 3,748,500
299 3,748,501

CLASS 308
9 3,747,997
3,748,000
10 3,747,998
15 3,747,999
138 3,748,001
174 3,748,002
187.2 3,748,003
212 3,748,004

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